PLASTICS & MOLDED PRODUCTS

Reg. U. S. Pat. Off.

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Contents

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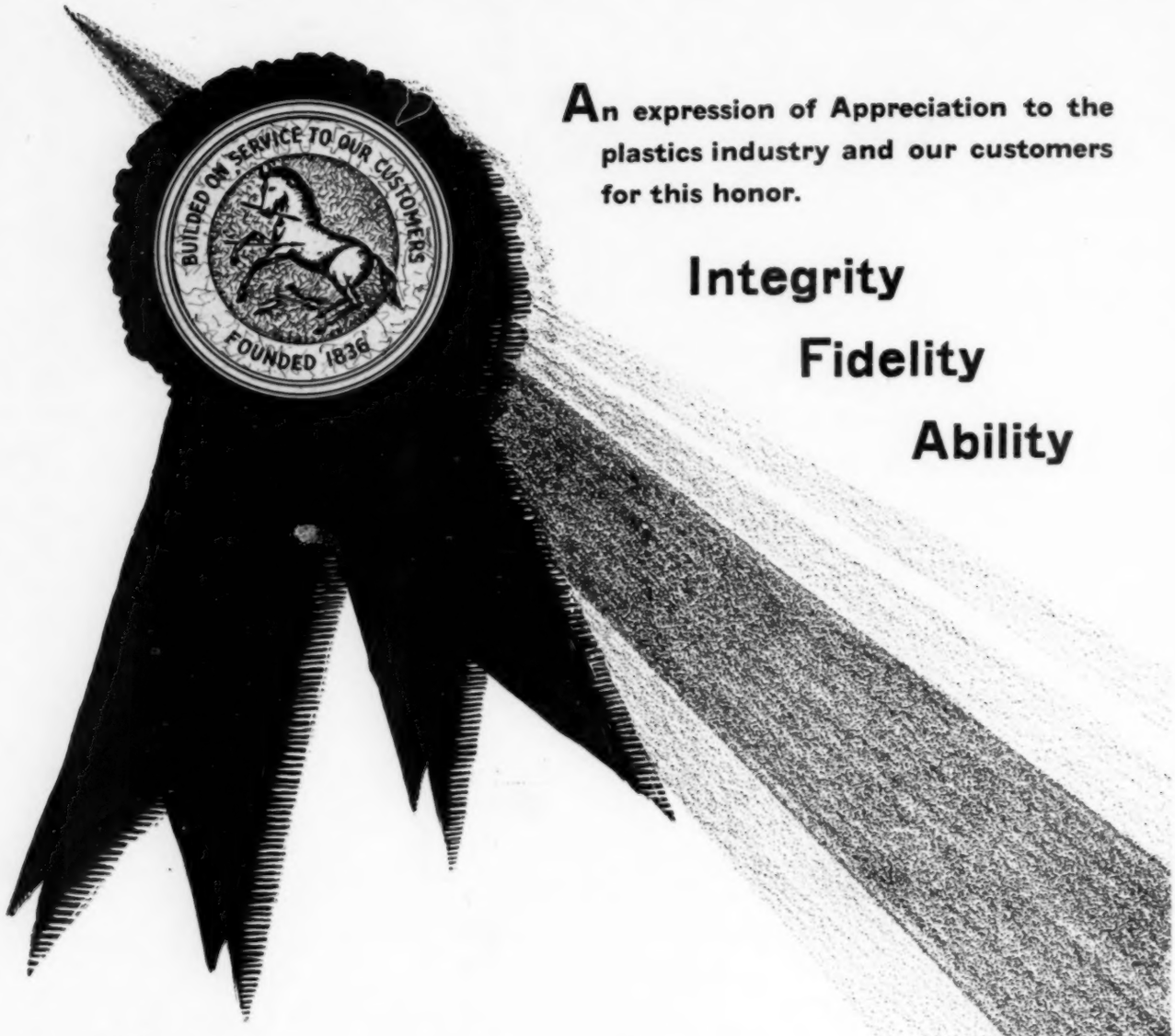

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Volume 6 DECEMBER, 1930 Number 12

The American Plastics Industry

Impressions gathered on the occasion of my visit to America; and some hints on the casein and blood-plastic field

By Heinrich Prehn
German Correspondent of Plastics

We had asked our German Correspondent, Mr. Heinrich Prehn, of Naumburg-Saale, Germany, who, as it will be remembered was a visitor to our shores a few months ago, to give us some of his impressions, particularly as related to the plastics industries. We feel that his remarks are interesting to many of our readers, as they touch upon conditions that require attention.

IN the glory of a magnificently beautiful day, with the great Atlantic peaceful as a mirror, our steamer, the S. S. Deutschland, approached the American Coast. The mighty impression that the view of New York presents to the newly arriving visitor from the harbor was unfortunately swathed in a light mist, only to break forth with greater effect on approaching closer. The entry into the inner harbor is an unforgettable event. What the new world has here accomplished is absolutely unique. But enough of these first impressions.

New York and Points West

New York pulses with tempo of modern life, of which the spirit of daring undertaking and the heaven-aspiring buildings are an inspiring example. A worthy counterpart of this cosmopolitan metropolis is the great city on the Lakes, Chicago. This latter city, not only is endowed by its enterprising citizenry with one of the world's most imposing sky lines and waterfront, but is also the home of the greatest stockyards of the world.

Through the kindness of the Editor of Plastics, I was able to view the outstanding sights of this western city. What impressed me most, is the mighty business thorofare, Michigan Avenue.

What the province of Westphalia is for Germany, is concentrated in the United States about Pittsburgh. Enormous understandings of the heavy metals industries characterize the landscape. Another outstanding example of the spirit of America is the automobile industry in and about Detroit.

The Capitol City, Washington, impresses the visitor by its splendid government buildings, the fine residential sections, and the wide-spread park system. But as much as one may revel in these manifestations of the handiwork of man, there is nothing that can equal the spectacle of the mighty Niagara, pouring its billions and billions of gallons of water over its brink on their way to the distant sea. No matter how materialistic the beholder may be, here is something that grips, impresses and overawes.

The framework of this article does not permit me to recount my various experiences and impressions, as this would lead far afield, but I can not refrain from pointing out many things that I saw, and which I believe are worthy of imitation.

Some Obvious Differences

Among the many impressions that are crowding my memory for recognition, I will only recount those that relate in some way to the manufacture and fabrication of plastics.

One difference is immediately apparent. While in the United States the main interest attaches to the materials suitable for molding, the Europeans on the contrary focus their attention on the particular raw material irrespective of its type—that seems most suitable for the purpose. I have made some

efforts to ascertain the reasons for this, and have arrived at the following conclusions.

One of the deciding factors is the question of wages, for the labor charges in the United States are on a very much higher level than in Europe. It is therefore not difficult to see why, in America, the cheaper raw material is the preferred one, for in the choice of a low cost raw material there is the possibility of more effective competition with European manufacturers. The American producers therefore naturally choose materials capable of fabrication at a low labor cost.

Another factor is this:—one of the raw materials competing with the thoroughly introduced celluloid, namely the casein solids, which first were given serious attention about 25 years ago in America, leaves much to be desired as to quality. Soon after the World War, casein solids manufacture began in America. The products, however, both as to intrinsic properties and form, had many defects, so that the consumers adopted them rather reluctantly. During the last decade their defects have been virtually over come, but the prejudice on the part of the consumer remains and is quite apparent wherever inquiry is made.

Casein Plastics High Here

The price of casein solids in the United States is also higher than it ought to be; this being mainly due to the high cost of the requisite raw material, rennet casein; which costs the American producer considerably more than it does his foreign competitor. Despite the high import duties, I found considerable imported casein solids both in the States and in Canada. The price of suitable plasticizable rennet casein is from 33⅓ to 50% higher in America than in Europe. This is astonishing, for America has a highly developed dairy industry, and although much of its products find their market in foods, it would seem feasible to work up the enormous amount of skim milk for this purpose.

Of course the manufacture of casein is very profitable where large amounts of milk are available at one point. However, casein is a product, that, once manufactured, may be stored for many months without deterioration. It is both a valuable food product, and a splendid industrial raw material.

Hand in hand with the national development of the dairy industry goes the production of casein. With suitable control this is perfectly practical. The buttermilk and whey that form the byproducts of butter and cheese manufacture are a good feed for pigs; being in some respects even superior to pure skim milk. In western France, which is the home of the best organized dairy industries of that country, it was found possible to manufacture casein, and to feed and keep as many pigs as before when feeding them whey instead of skim milk, the casein in the feed being replaced by less expensive feeding materials.

The solution of this problem is a very thankful one for those undertaking it. A casein plant can readily be added to any existing dairy without much cost.

But it is not only the already mentioned defects in the American casein needs as formerly produced that prejudice the consumer against this most useful raw material. Many sins of commission and omission are also responsible. These lie in the fabrication of the material. In Europe, where the casein solid industry had it origin, one may at once notice the serious attention that is given by the producers to the form of the raw material, so that it will be most suitable for further fabrication.

It is astounding how many articles are made abroad of casein solids—from spoons and shoe-horns to clothing racks, cutlery handles and the like. What is the reason for this?

The answer is not difficult. For example, the raw material is made as far as possible in the shape in which it is eventually to be fabricated; such, for instance, as blanks for buttons, tags, game-chips, etc. The blank can then be fed to automatic finishing machinery according to the most modern methods.

Chemical Polishing of Casein

When one however finds, as I did, in America, that many casein solids are still being painfully and slowly polished by mechanical means, instead of chemically, it is not surprising that the finished articles cost too much.

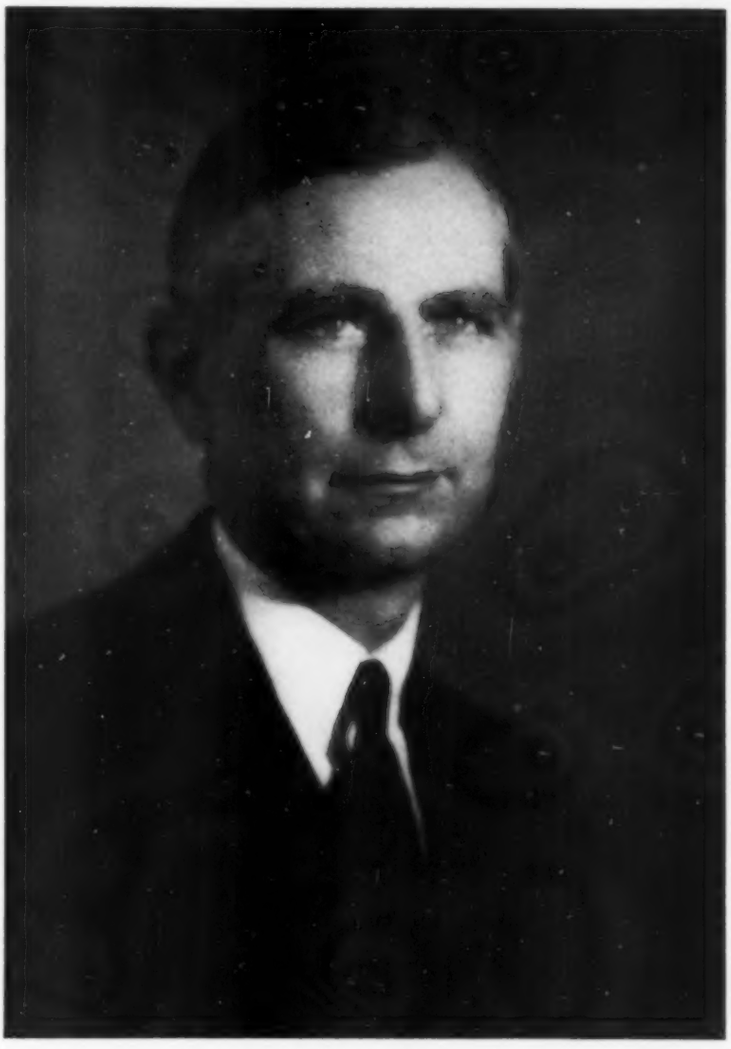
There are a number of *chemical polishing processes;* of which one that I am sponsoring, is particularly effective and extremely low in cost, coupled with great rapidity. For example a gross of casein solids buttons can be polished in a few seconds at a price of less than a cent. Pieces of any size can be polished, and neither special dyers nor equipment are required. The arrangement is very simple, and the polish is every bit as good as that secured mechanically, and is even more durable.

It is far from my intentions to break a lance for the casein solids industry and know their short comings as well as their advantages. For instance, it would be nonsense to make a goblet out of casein plastics. The surface polish of casein articles, however, is inimitable and better than that of any other plastic. For many uses, however, casein solids can not compete with other artificial materials such as molding powders.

Among the molding powders, however, there is one that is really very much underestimated. I refer to *blood powder.* Thus far this material has only conquered a small portion of the plastics field, while in Europe this material is much more appreciated.

Molders Association Chooses L. G. Sylvester As Chairman

President of American Record Corp. is well qualified to guide NEMA Section's Intensive 1931 program



Mr. Louis G. Sylvester

THE Molded Insulation Section of Nema counts itself very fortunate in having Mr. L. G. Sylvester as its new chairman. Among his many outstanding characteristics, two appear most prominently as the reasons for his selection to guide the destinies of the industry's trade association. These are his complete familiarity with every angle of the industry's activities, technical, sales, and management and his straightforward manner of dealing with everyone with whom he comes in contact.

Louis G. Sylvester was born March 18, 1884, at Auburn, New York, where he lived until 1893 when his family moved to Scranton, Pennsylvania, his present place of residence.

He attended schools in Scranton, entering Cornell University in 1903, taking an academic course. After finishing college in 1907 he entered the employ of The Scranton Button Company, at Scranton, Pennsylvania, then large manufacturers of buttons, electrical insulations, specialties and novelties of shellac composition, starting at the bottom he worked in Mixing, Pressing, Finishing, Engineering, Shipping, Estimating and Selling Departments for a number of years, thoroughly learning all branches of the business.

In 1917, while Assistant General Manager, he induced his concern to equip and enter into the manufacturing of phonograph records, devoting much of his time to this branch in developing it into a large and important branch of the business. Later the Scranton Button Company expanded their field to include the molding of Bakelite and similar phenolic compounds.

Through the Ranks

Mr. Sylvester became in time Assistant General Manager, General Manager, Vice President, and in 1925 President of The Scranton Button Company.

In August 1, 1929, The Scranton Button Company merged with the Regal Record Corporation, of New York, and Cameo Record Corporation, of New York, forming the present American Record Corporation of which Mr. Sylvester is, at present, Chairman of the Board and President.

Mr. Sylvester is married, has two daughters twenty and sixteen years old. He is a director of the Dime Bank-Lincoln Trust Company, Scranton, Pennsylvania, Industrial Thrift and Loan Company, Scranton, Pennsylvania, Independent Laboratory, New York City, and Pacific Pathe Record Corporation,

(*Continued on page 733*)

Mass-Production of Fountain Pen Tubing

Method of regenerating the solvent used in rendering pyroxylin plastic tubes adhesive forms the essential feature of the process

THE lower priced fountain pens are mainly made from pyroxylin plastic tubing; higher priced pens being produced from pyroxylin plastic rods that are drilled and machined. As the mass-production of the cheaper pens requires enormous amounts of tubing, any process which will lead to better and lower priced tubing is interesting.

While many methods for producing such tubing have been described, there appears nevertheless to be other possibilities, mainly improvements. Into such class belongs a patent, U.S. P. 1,755,786; April 22, 1930, owned by the Sanite Corporation, of Burlington, N. J.

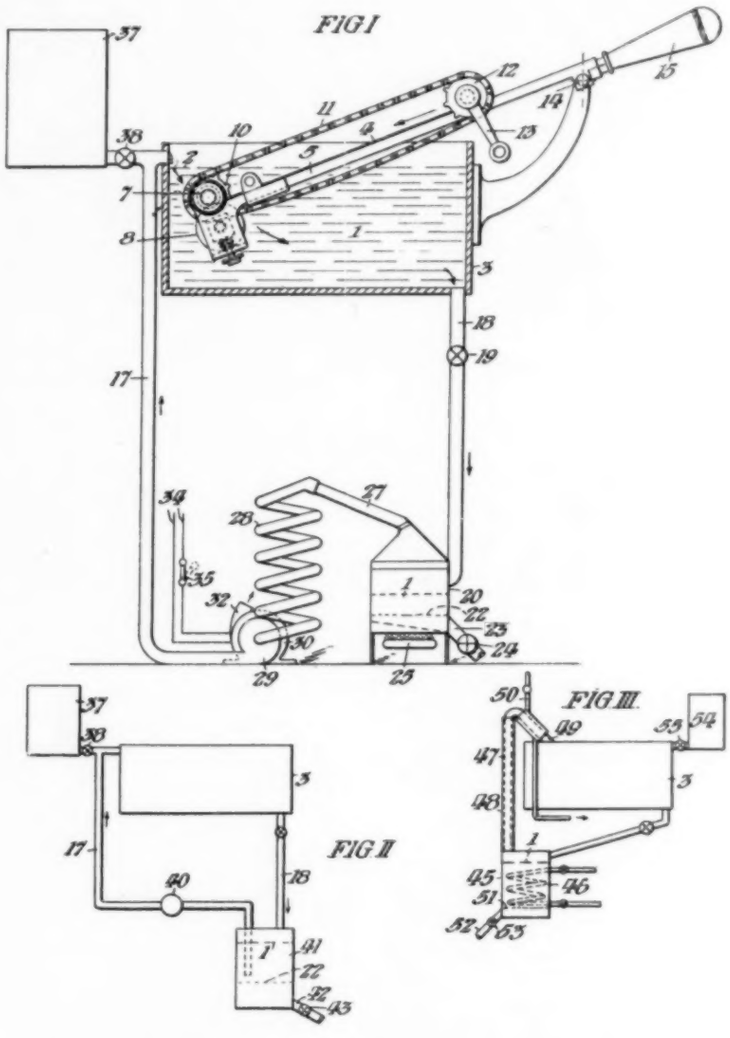
The invention, as described by the inventor, William Mendel comprises novel steps in regenerating the solvent employed in softening pyrolxylin sheets that form the basis for the tubes.

The general method follows that of John N. Whitehouse (U. S. P. 1,661,451; March 6, 1928).

Rolling the Sheets

For instance, in the formation of tubes but four inches long, for fountain pens, by rolling sheets of celluloid .010 of an inch thick, four inches wide, and twelve inches long, in a bath of acetone; altho each sheet is immersed but five seconds, so much of the sheet material is dissolved in the bath that the initial solvent capacity of the latter is progressively lessened so rapidly that not more than twenty such tubes can be made before the solvent capacity of such bath becomes insufficient to render the successively wound convolutions of the celluloid coherent. Such pollution occurs even more rapidly if the celluloid includes powdered metal, fish scales, or other pigments which are usually employed to fancifully figure or color the celluloid. Moreover, such an acetone bath is so hygroscopic that it rapidly absorbs moisture not only from the celluloid but from the supernatant atmosphere and the bath is rendered inefficient when it absorbs as much as one and one-half per cent of water; such absorption being attained in a few hours when such atmosphere is only naturally humid.

As hereinafter described, the invention includes methods of and means for forcibly circulating the solvent to and from the sheet material being formed



Illustrating the method employed in softening pyroxylin sheets and forming them into tubes.

into tubes, and to eliminate the deleterious material from the solvent by precipitating such deleterious material and distilling or decanting the solvent from such precipitate.

The apparatus used is shown in the drawings; Fig. I being a diagrammatic, partly sectional, elevation of apparatus; Figs. II and III being diagrammatic elevations of apparatus including respective modified forms of the invention.

Regeneration of the Solvent

Referring to Fig I, the bath 1, which may comprise acetone or any other suitable solvent of tube material, is maintained at approximately the level 2 in the container 3 in position to submerge the sheet of material 4, which is temporarily supported by the frame plate 5, to be wound on the rotary mandrel 7 under pressure of the idle rollers 8; said mandrel 7 being conveniently rotated by the chain wheel 10 which is connected by the chain 11 with the wheel 12 which may be turned by the crank 13. Said frame plate 5 is mounted upon the rock shaft 14 so that the winding mechanism may be lowered to the operative position shown or be raised to the idle position by the handle 15.

The solvent liquid is preferably continuously circulated in the container 3 during the winding operation by means which moves it to and from the celluloid. Such circulating means conveniently includes the inlet conduit 17 and the outlet conduit 18, the latter being controlled by the valve 19.

As shown in Fig. 1, said conduit 18 leads into the still 20 of sufficient capacity to maintain the desired quantity of the solvent 1 above the precipitate 22 which may be removed thru the discharge outlet 23 under control of the valve 24. Said still may be subjected to heat from many suitable source, for instance, the burner 25, so as to volatilize the acetone 1 from the residue 22 in said still, which residue includes water, celluloid, and the pigments aforesaid. Of course, in order to thus eliminate water from said solvent, it is necessary to effect such distillation at a temperature below 212° C. The gaseous acetone passes from the still thru the conduit 27 to the worm 28 in which it is recondensed to liquid form and from which it is received in the rotary pump 29 which discharges it back into the container 3 thru said inlet conduit 17. Said pump 29 is conveniently operated by the electric motor 30 which also operates the air pump 32 for cooling said worm 28. Said motor is conveniently energized thru the conductors 34 under control of the switch 35; whereby the circulation of the solvent liquid and cooling of the worm may be simultaneously controlled.

As a portion of the liquid contents of the circulatory system must be continuously or intermittently wasted thru the drain 23; it is convenient to include, in the apparatus, a container 37 for fresh solvent which may be admitted to the inlet conduit 17 under control of the valve 38. However, whether the apparatus includes such container 37 or not, it is adapted to forcibly move the solvent bath 1 to and from the celluloid 4 which is being formed into a tube and to maintain said solvent efficient during successive winding operations by the elimination of deleterious matter therefrom.

The distillation apparatus aforesaid is not only advantageous in that the solvent may be thereby continuously maintained at maximum efficiency by reason of the elimination of the deleterious material therefrom; but because the freshly distilled acetone has a greater solvent effect upon the celluloid, per unit of volume, than commercial acetone.

As it might be assumed that the aforesaid greater efficiency of the freshly distilled solvent is due to increase in its temperature incident to the distillation process; it may be stated repeated tests have shown that such in creased activity is manifest even when the temperature of the freshly distilled acetone delivered into the container 3 thru the conduit 17 is lower bath 1. However, if the acetone is allowed to remain stagnant after such distillation, it loses the increased solvent efficiency However, if the acetone is allowed to remain stagnant after than the temperature of the increased solvent efficiency which characterizes it when freshly distilled.

Separation of the Recovered Solvent

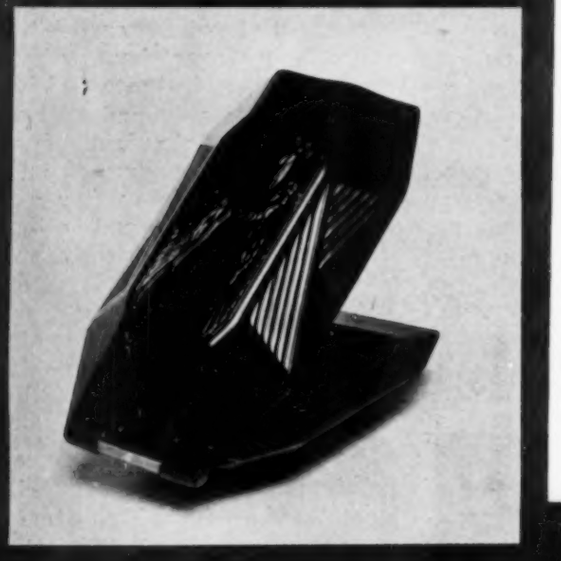
Altho it is preferred to eliminate the deleterious matter from the solvent bath 1 by continuous circulation and distillation thereof as above described; such deleterious matter may be eliminated, continuously or intermittently, with respect to the winding operation, by decantation. For instance, in Fig. II, the conduits 17 and 18 are part of a closed circulatory system including the pump 40 and the decanter 41. The water and celluloid, pigments and other deleterious matter 22 gravitate to the bottom of said decanter 41 from which they may be continuously or intermittently discharged thru the conduit 42 under control of the valve 43.

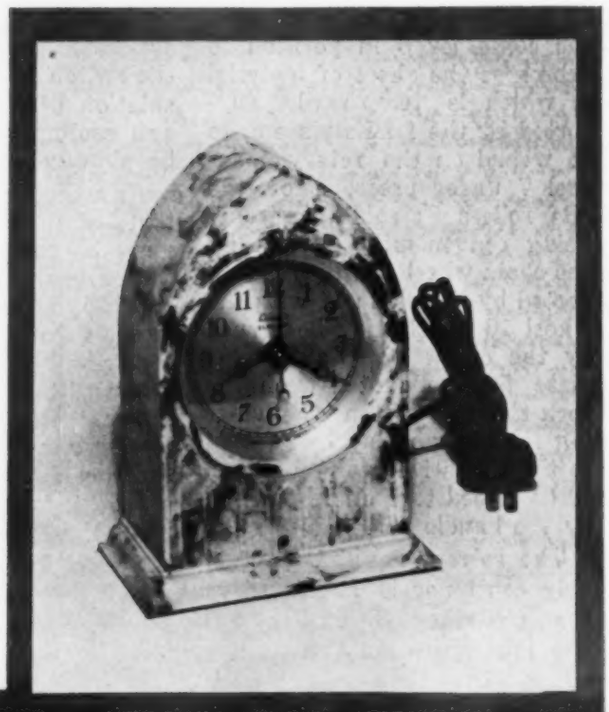
The simple distillation apparatus shown in Fig. III, is preferable wherein the still 45 is heated by fluid, such as steam or water, circulated thru the coil 46, and the vapors of distillation rise above the level of the solvent bath container 3, thru the conduit 47, provided with the heat insulating covering 48, and are condensed in the conduit 49 by tap water supplied through the conduit 50, so that the condensate gravitates into said container 3. The deleterious matter 51 may be discharged from said still 45 thru the conduit 52 under control of the valve 53 and the bath be replenished with purified solvent from the container 54, under control of the valve 55.

Christmas Gifts Synthetic Plastic Attractive, Ap- Accep-

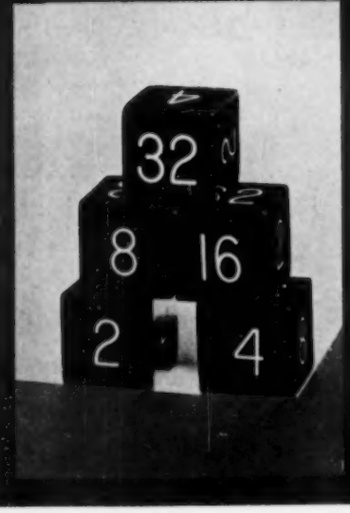
The richness and warmth of the gentlemen's toilet set in onyx Amerith, made by the Celluloid Corporation, almost makes one lose faith in the natural, so handsome is the synthetic plastic material.

Medieval craftsmanship is combined with modern mass production in this Elgin watch display and carrying case, molded of Durez.





Mottled Aldur houses another electrically-operated clock, the Lincoln.



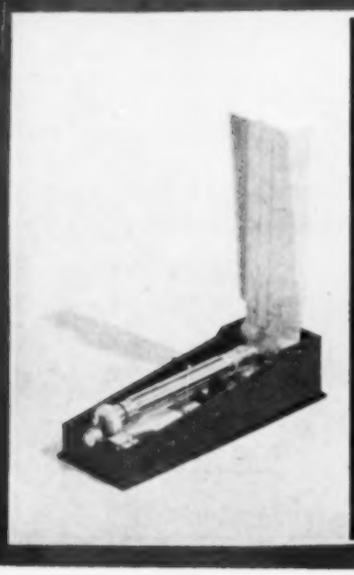
Catalin lamps and art boxes find favor as do the backgammon doubling blocks.

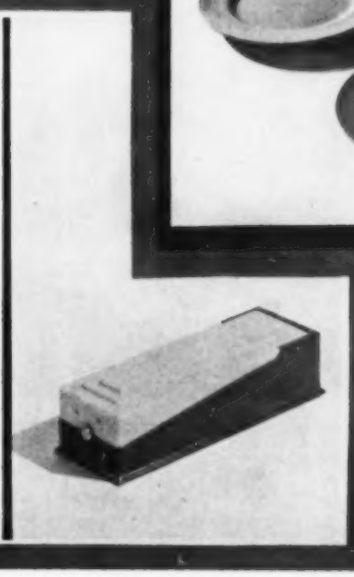
for all, of Materials are pealing and table

The molded Lumarith poker chip set is dazzling enough to make one overlook a full house.

"Seven come eleven" need no longer be accompanied by the click of the ivories with the molded "Read 'em and Weep" device. Under the roulette top is a cigarette container.

Aldur also goes into molded tableware. The compartment plate and teacup and saucer are made of jade green material.





Beetleware cups and saucers, cake plates, ice-cream dishes, sugar and creamer are being widely distributed. These are available in many light colors.

The Archdale razor, which permits adjustment to fit individual beard angles, is enhanced by a molded case produced in lustrous Bakelite molded material.

Self-Restraint in Business*

By Clarence L. Collens

President, National Electrical Manufacturers Association

OUR American institutions are founded upon and can only survive under a proper balance between individual liberty and the free play of individual intelligence and initiative on the one hand. and on the other such restraints as are necessary to safeguard the rights of others or the welfare of society as a whole. These restraints may either take the form of laws enforced by the police powers of the Government or may be self-imposed.

As society becomes more intelligent and more civilized it functions more and more through the exercise of self-restraint on the part of each individual than through the police powers of the Government. Each individual recognizes a definite responsibility to society entirely aside from those imposed by law and, in fact, laws become dead letters unless endorsed by the co-operation and self-restraint of the majority. In the ideal social order laws are unnecessary.

A parallel may be drawn in the business world which can only function properly — and by properly I mean render a necessary service with full recognition of the rights and economic interests of all parties involved—by a similar balance between freedom of individual action and proper restraint. Here also the restraint must be both legal and self-imposed, for laws alone cannot make business function properly any more than laws alone can make society civilized.

The flagrant disregard of some of the principles upon which our American institutions are founded, has gradually developed into legislation which places definite restraint on business, all tending to prevent monoply, to promote and preserve the competitive system and under the competitive system to make business fair both to competitors and to all consumers. Even under these legal restraints, competition may be either ruthless and ruinous or intelligent and economic, for our laws are merely concerned with one side of the economics of business, namely, protecting the purchasing public from artificial enhancement of prices, but in no way protecting any industry from the ruinous prices of one or more competitors.

Keep Competition from Becoming Ruinous

Ruthless, ruinous competition represents the perversion of individual liberty and does not bring to the inherent right of the individual to do business, or to individual initiative and intelligence, the reward to which business is properly entitled and which it has never been the intention of the law to destroy. Competition cannot become fair and economic unless to the legal restraints which are recognized as necessary are added the idea of **self-restraint.** Just as in the ideal social order, so also in the ideal business world, competition requires no laws and functions properly with due regard to the interests and rights of all parties concerned, because it is intelligent, self governed and self-restrained. Voluntary self-restraint in respect to one's actions, for the reason that the course decided upon appeals to the judgment and intelligence, is always more acceptable than to have some outside power make a given course of action compulsory.

In many industries where competitive conditions are unhealthy, it is not a change in law that is required to cure the disease, but rather a change of heart and the development of mutual respect and confidence. There must also be a sincere desire on the part of each executive to recognize a definite responsibility to the industry in in which he is engaged, to be better informed regarding the motives and policies of his competitors, and the facts of the market situation, to use his liberty of action wisely and to exercise intelligent self-restraint in the conduct of his own business. Without such a change of heart on the part of many business executives, unhealthy and destructive competitive conditions cannot be improved.

Recognizing all legal limitations and acknowledging these as necessary and desirable, what liberties do I have under the competitive system and what self-restraint am I willing to impose on myself in doing my share towards promoting intelligent economic competition in the industry in which I am engaged?

First and foremost in a competitive system, it is my right to determine my own price policies and price schedules. By price schedules I mean lists, discount schemes, classification of customers, and terms and conditions of sale. Even though I have full freedom in this respect, it is also my right or within my control:

*An address delivered at the annual meeting of the National Electrical Manufacturers Association at Old Point Comfort, Va., October 20, 1930.

1. To distribute my established price schedules freely to both my competitors and my customers.

2. To make my price schedules simple and definite, easily understood by both my competitors and my customers.

3. To eliminate all secret rebates or any other form of price concession not clearly and definitely indicated on my published schedules.

4. To base my price schedules on accurately determined costs plus a fair margin of profit, or to follow the price policies and price schedules of a market dealer if my own interests and those of the group are in my judgment best promoted by so doing.

The competitive system does not presuppose or require lack of accurate knowledge regarding current market conditions or the price schedules of one's competitors. Basing individual price policies on trade rumors, statements made by buyers, and indirect information which in many cases is misinformation, is not required by law and is one of the principal causes in developing an uneconomic competitive situation. I prefer that my competitors know directly from me where I stand and am willing to place that information in their hands.

The above relates to such products as I regularly list. There are always "specials" whose price cannot be determined by published information. If it is my right to distribute published current market information, I feel it is also within my right to advise any other competitor of the facts regarding any current transaction involving specials and, if he is willing to give me that information, to receive from him the facts regarding his quotation on the same transaction. In respect to standard competitive products, it is usually some market leader who sets the pace. But any competitor may be the first in the field with a "special" and it is, therefore, even more important that in respect to specials, I observe the policy of basing price on accurately determined costs plus a fair margin of profit.

A liberty which many desire to have is that of "price-cutting" but no competitive industry can be healthy and economically sound where price-cutting is prevalent Price-cutting, that is, deviation from one's established prices, is unfair both to one's competitors and to other purchasers who under similar conditions have not enjoyed a price cut. Disguised under the legal permissive qualification of "necessary to meet competition," it is in many cases deliberate or is based on misrepresentation or inaccurate information of the competitive situation, and as such, is illegal price discrimination. Its ultimate effect is "to substantially lessen competition" by means of the elimination of the weak. This is the phase of competitive relations where self-restraint counts most and in the interests of both the purchasing public and my competitors I am willing to pledge myself to maintain a firm price policy, and whenever I feel that price changes by me are "necessary to meet competition," I will effect the change not by a price cut on an individual negotiation but by a general adjustment in my price schedules to be enjoyed by all my customers and with the usual publicity to the trade

On Competitive Advantages

It is also my right to introduce any commercial practice in the conduct of my business which in my opinion will give me a competitive advantage. Here again intelligence and self-restraint are absolutely necessary. Each executive must bear in mind that any price or any practice introduced by him to gain individual competitive advantage, if it proves effective, will be followed by his competitors, or his competitors may even go him one better, the individual advantage being then lost. It is rivalry in introducing ways and means of gaining individual competitive advantage that reduces many industries to unhealthy conditions. I will not introduce any price or commercial practice to gain individual commercial advantage which if followed by my competitors generally would be uneconomic or commercially unsound. Examples of such practices are extension of terms of payment beyond those generally recognized, too liberal guarantees, consigned stocks out of all relation to the possibilities of business, excessive entertainment of customers, secret rebates or other concessions not shown in published price schedules, price differentials not justified by one's competitive position in the industry, etc.

I also feel at liberty to frankly tell any of my competitors what in my judgment are the harmful effects of any of his policies or in what respect his competitive practices are uneconomic or commercially unsound. I legally cannot attempt to influence his decision other than by appealing to his own judgment and intelligence and if of his own free will and purely as the result of a better knowledge of the entire situation, he changes any of his practices, it cannot be claimed that I have conspired with him in restraint of trade.

And now to a liberty which some might deny. I feel it is my right to meet with my competitors as a group and discuss freely and frankly the economics of our industry and competitive practices which are unfair, destructive or unsound from a broad business standpoint. Such meetings do not imply illegal understandings or agreements. I will not be a party to such understandings and reserve for myself absolute freedom of individual action and the right to make and change my individual decisions at any time. Are such meetings necessarily in restraint of trade? We are told that it all depends on the result or effect of the meeting.

To be in restraint of trade, irrespective of the results or effects, I feel it must be definite-

ly proven that there was restraint to any executive's freedom of individual action in the control of his business, that the decisions of some individual executives were influenced by threats or the fear of reprisals, that there existed a moral obligation to follow some recommendation made, or that such meetings were used as a cloak to exercise arbitrary, monopolistic powers in respect to prices. If such meetings permit me to conduct my business more intelligently, with a more accurate knowledge of the competitive situation, and with greater fairness both to my competitors, my stockholders and my customers, or to make decisions in respect to my individual policies which assist in eliminating unsound commercial practices, I am not infringing any of the basic principles of a competitive system or of laws which have been set up to protect that system.

To summarize, I make the following statement and pledge to my competitors:

I endorse the competitive system and reserve for myself entire freedom of individual action and the right to make and change at any time my decisions in respect to prices and competitive practices. Recognizing, however, a definite individual responsibility to the industry in which I am engaged, I pledge myself:

1. To make my published price schedules simple and definite, capable of easy interpretation and administration, and to refrain from all secret rebates or other secret concessions affecting prices or terms and conditions of sale not clearly indicated in my published schedules.

2. In respect to all products which are generally competitive to keep my price schedules in proper economic balance with the current market situation.

3. In respect to "specials" to base my prices on accurately determined costs plus a fair margin of profit.

4. To distribute my published price schedule generally to my competitors and to the trade.

5. To maintain a firm price policy and only effect price changes by a general change in my published schedules.

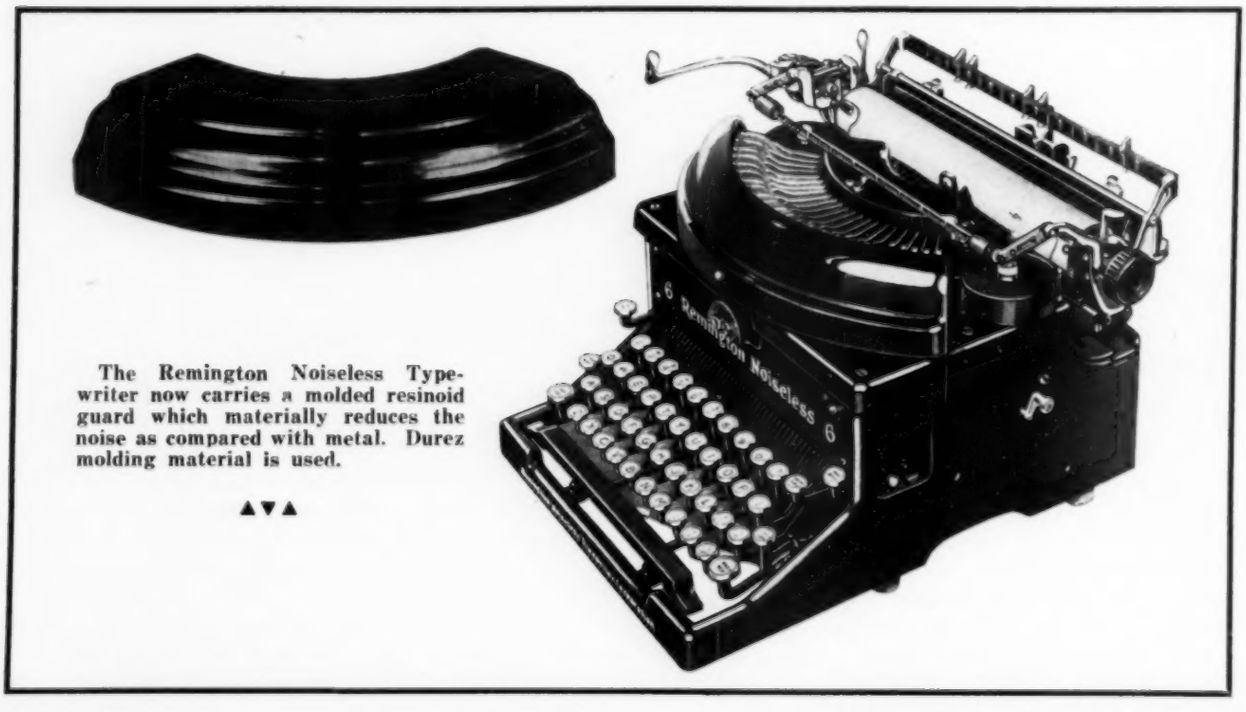
6. To promptly give to any other executive such facts in relation to my prices and price schedules as will assist in correcting any misinformation which might otherwise exist as to the competition which I am giving the rest of the industry.

7. To base my decisions in respect to competitive practices on established facts and to give no credit to rumors, or to incomplete or indirect information regarding the practices of my competitors.

8. To refrain from introducing any practices to gain individual competitive advantage which if followed by my competitors generally would be uneconomic or commercially unsound.

This is the platform on which I stand in the conduct of my own business, as far as any action by me affects the interests of the industry in which I am engaged. If each executive in a competitive group will be as frank in advising the public and his competitors as to just what his policies are, competition will be none the less keen, but it will be saner, more intelligent and more economic. It merely eliminates guesswork, rumor and misinformation as a determining factor in price and price policy decisions. Reserving entire freedom of individual action, an executive in control of an individual business in a highly competitive group, is certainly entitled to such facts as are

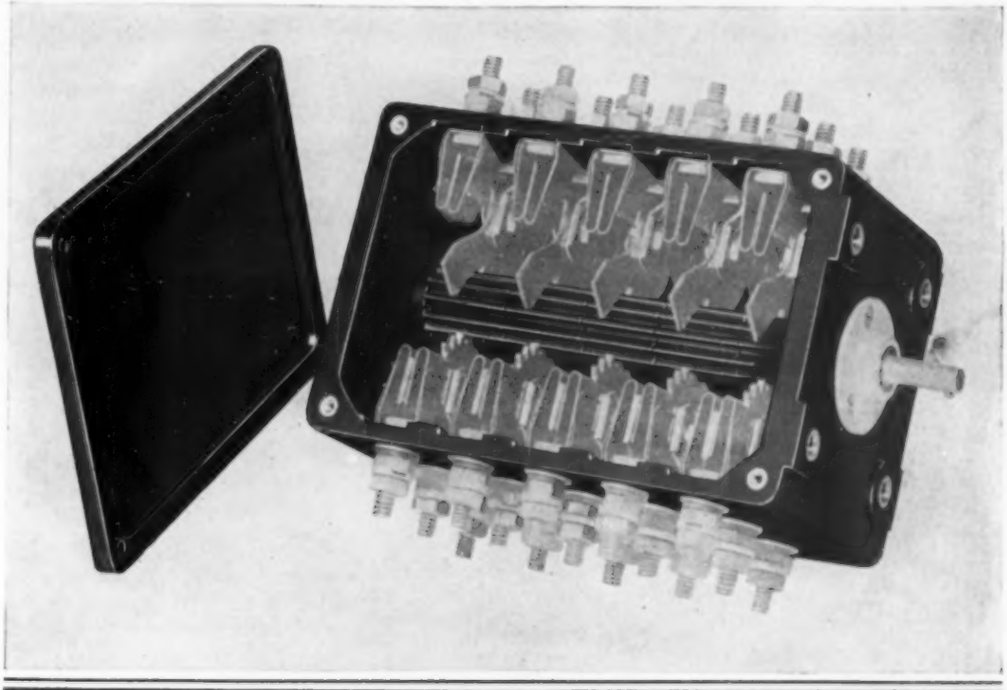
(*Continued on page 733*)



The Remington Noiseless Typewriter now carries a molded resinoid guard which materially reduces the noise as compared with metal. Durez molding material is used.

▲▼▲

TEXTOLITE CASE AND ROTOR PROVIDE POSITIVE INSULATION IN THE Roto-Test SWITCH



Roto-Test Switch
Manufactured by
METER DEVICES CO.
Canton, Ohio

A DIELECTRIC strength of 30,000 volts per 1/4 inch of thickness . . . toughness, durability, attractiveness, and low cost . . . led the Meter Devices Company of Canton, Ohio, to specify Textolite molded for the case and rotor of its new Roto-Test switch.

Actually there are eight molded pieces: two covers, five gear segments of the rotor, and the case proper. The last comes from a single mold with thirty-one holes and eleven recesses formed and sixteen inserts embedded, all ready for assembly.

If there is a part in your product that can be molded, General Electric offers you its engineering service, its research and manufacturing facilities, backed by twelve years' experience in producing over half a billion moldings. To get in touch with the Textolite specialist in your district, address the nearest G-E sales office.

885-49

GENERAL ELECTRIC

SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

REYNOLDS BAKELITE

ALDUR LUMARITH

When accuracy and delivery is vital, leaders in industry come to us for Bakelite moulding. Our years of experience, vast manufacturing facilities, the non-changeable policy to mould only to the 'nth degree of accuracy and to deliver continuously when promised are factors demanding recognition. Our facilities offer you a complete moulding service—Engineering development, Mould and Tool control, Raw Materials, Moulding and Finishing assembly.

Most manufacturers put their problems up to us for an accurate economical solution. We have yet to fail in developing any problem involving moulding of Bakelite.

Your inquiries with sketches or samples will have prompt attention—send them along with confidence.

REYNOLDS SPRING CO., Jackson, Mich.

The Plastics Industry Abroad

A resume of accomplishments and a sketch of trends of future developments are discussed

By Dr. K. A. Pelikan
Research Chemist, Celluloid Corp.

THE plastic industry, both here and abroad, has obviously reached a stage where its checks and balances may be gauged and its present status determined. The current worldwide, general business depression naturally caused reverberations in the plastic industry, prompting the conclusion that the major ill is, broadly, not over-production so much as over-capacity for production. The constant and persistent development of new materials and new material-producing units without the simultaneous development of new markets and new applications is fundamentally unsound in any industry. To a degree, this has been the bane of the plastic industry, certainly in Europe, and in a lesser measure in the United States. To determine the extent of this condition and at the same time turning a spotlight on the entire structure of the plastic industry abroad will be the purpose of this paper.

The Industry's Journals

One of the first points to consider is the number, quality and scope of the trade and technical journals devoted to the interests of the industry. The oldest magazine treating these subjects was the German "Kunststoffe," which, founded before the war, is still the best source of authentic plastics information covering Central Europe. Although several British, French and German special journals existed, devoted to rubber and cellulose respectively and almost exclusively, it took years before the plastics field assumed sufficient importance in these countries to warrant support of its own publications. In this country "Plastics and Molded Products," now in its sixth year, was the first publication in the English language exclusively devoted to the subject. The French "Revue Générale des Matiéres Plastiques" entered its sixth year on January, 1930, and the "British Plastics" is in its second year. Both as well as "Kunststoffe," devote part of their space to rubber, accelerators, cellulose, and related subjects, not to the disadvantage of the readers. It is a pity to see that the increasing volume of scientific and technical articles, lectures, patents, and industrial and economic news forces not only the editors to separate the various branches into different units of publications but forces the readers also to cut down on their own reading. The similarity of problems in rubber, cellulose, textiles, synthetic resins and plastics in general (caused by the close relationship of their colloid chemical nature and technical behavior), is sometimes so striking that knowledge of the technique of handling one of them means very often the solution of problems in another line.

Discussing sources of information on European plastics, the authority will admit that it is exceedingly difficult to form an absolutely true mental picture of this field. Generally speaking, these are the sources of information: articles in scientific and technical magazines, patents, industrial pamphlets and advertisements, lectures, salesmen and exhibition.

Scientific papers on plastic subjects are as rare as old paintings. One of the most recent textbooks[1] of outstanding merits is written in German and can therefore not easily be read by everybody. It refers up to the time of U. S. Patent 1,679,246, and covers most of the problems exhaustively. The informative value of patents has been discussed often enough. They form " a kind of no man's land explored by roving adventures in search of high dividends. Sometimes in opposition to, sometimes in combination with, nations anxious to be self-sufficient."[2] Judging by the ever increasing number of patent applications, the layman must get the impression of having to deal with a tremendous industry of growing dimensions. An abundance of patents is inevitable for the present, but serves as a safe indicator for the trend of the general development.

Plastics at the Expositions

Lectures, pamphlets, advertisements and salesmen are sometimes one-sided and so, deceiving. But they let us feel the pulse of the industry. This can be more suitably tested with regard to exhibitions and fairs. The British exhibit at Wimbledon, and those at Antwerp, Liege, Seville and Barcelona, just to mention a few, certainly have been able to demonstrate that some companies and countries are producing materials of outstanding value and beauty, but by no means do they represent the average standard of the industries involved. Germany gives us the opportunity to study her products, and partly those of her neighbors, at

closer range by means of her unique Leipzig Fair, which takes place twice a year, demonstrating all the products that are manufactured to be sold; i. e., not museum prices, patent samples or scientific curiosities, but salable merchandise giving us actually the confirmation that this or that type of plastic is an established marketable fact and waiting for buyers.

And by sifting out the wheat from the chaff, we discover, that the kettle of European plastics still simmers very closely along the traditional lines of the art, namely, phenol and amino-resinoids, pyroxylin, cellulose acetate, casein products, and some others of less importance as yet. But this state of affairs bears all indications of pregnant surprises and pending changes.

Molding Powder and Solids

The clash of the two outstanding pillars of the synthetic resinoid world at the Chemical Congress at New York in 1912, Raschig and Baekland, demonstrated the difference in chemical opinions, but also separated the industrial trend of the two continents represented by them. The fact is, that Baekland and his imitators on the American continent stuck to the idea of molding powders, i. e., mass production; and Raschig followed his idea of block, sheet and rod production, i. e., competing with the celluloid and hard rubber industry. The interesting part of it is that both succeeded extremely well and that both continents finally added the experience of the opponents, or their co-inventors and imitators, to their own. This brought Catalin and others to the United States and made Bakelite establish manufacturing places in almost all of the European countries. Raschig's products, bearing the trade names of Leukorit, Dekorit and Vigorit, based, as all of the following, upon phenol, cresol and formaldehyde as raw materials, have become very popular and a dozen or even more smaller companies brought similar products on the market. But two outstanding achievements: absolutely white and light-fast products and sheets of any size and thickness are mastered by a few companies only — Dr. Raschig, Ludwigshafen, Herold, Hamburg and F. Pollak, Vienna. Herold, the sales and control organization for Schmidt's Gummiwaren-Fabrik, Stade i.H, seemed to expand more rapidly into foreign countries than the others. The American Catalin Corp. is operating under Herold licenses. The latest development is Herold's foothold in England, where the manufacturing rights were acquired by the Metduro, Ltd.; the selling rights by F. W. Maul & Co. in London. Production is to start late this year.

Herold is controlled by the New York Hamburger Gummiwaren Co., which lately acquired her next door competitor: Gummiwaren-fabrik, Dr. Heinrich Traun und Soehne, in Hamburg and Harburg, manufacturers of hard-rubber and the phenolic plastic Faturan. This change of front of the hard rubber interests was influenced by the demands of the radio and electrotechnical industry, which called for a cheaper and faster curing product than hard rubber. Curiously enough, most of these phenoplastic materials do not enter into radio sets, exclusively, but have found many other and undoubtedly more profitable outlets. Two of the luxury liners for the Canadian Pacific Railway have been panelled with Herolith and reports have it that a new hotel in London is being wall-plated with the same material. The new greyhounds of the ocean, Bremen and Europa, offer a special comfort to the better class travellers by the installation of white toilet seats, made from the same material as above. The Bremen alone is supposed to have nearly 1000 of these seats. We hear that another liner, the "Britannic" also is to be equipped with synthetic plastic fittings.

Do we see the trend of this development in the right light? Cheap raw materials and volume of output. Cigarette holders and ash trays may form fine starting points and experimental grounds for a small and young concern, but it takes a long time to sell a reasonable quantity of poundage in shape of fountain-pen rods. Most companies would prefer to deliver the poundage in toilet seats, bowling balls, wall panelings, etc.

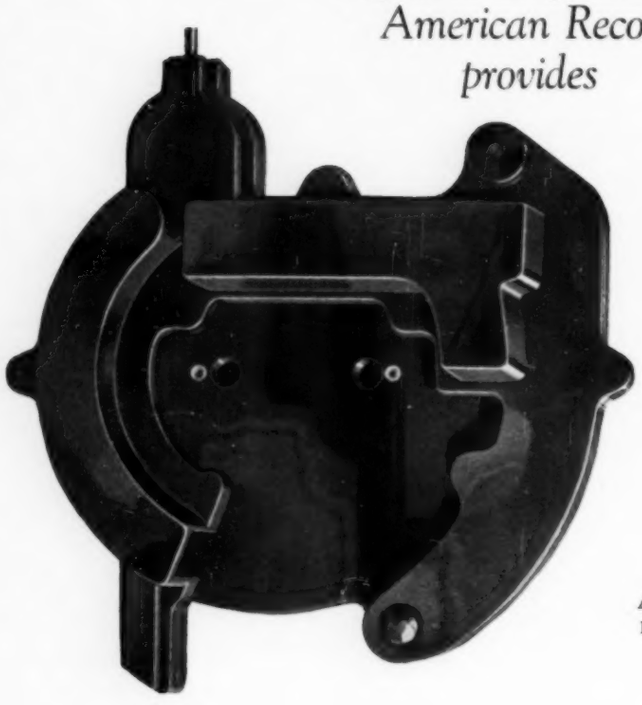
Electrical Requirements

Let us return to the electrical industry and its search for a rapidly curing moldable insulating material. The larger companies started their own manufacture of phenolic molding powders and laminated materials. The Bakelite Co., was established in Berlin, absorbing the Lebach process, Knoll & Co., Ludwigshafen. The A. E. G. produced Tenazit (Textolite of G. E. in the United States), latterly entering the glyptal field, probably inspired by their associated company in the United States. A number of smaller concerns worked along similar lines, as far as the patent situation premitted a clear sailing. The Kabelfabrik und Draht Industrie in Vienna with Futurit, Ambrasitwerke with Ambrasit, Bosch with Boschbakelit; and just to mention some more trade-names, other countries besides Germany included: Bakdura, Durax, Estralit, Isolierstahl, Gummon, Trolon, Tenalan, Presszell, Pertinax, Gear, Bikarton, Bituba, Carta, Turbonit, Turax, Neolith, Repetit, Peralit, Novotext, Turbax, Pressmikanit, Megohmit, Micafolium, etc. The Rommler A. G. produced Hares material for a while. But they found it necessary to merge with a larger consumer of electrical articles and the combined name of the concern is now the Kontakt-Rommler A. G. in Frankfurt and Ber-

(*Continued on page 726*)

MOLDINGS

like this complicated part require craftsmanship such as American Record provides



Liquid Measure Mercury Gauge

Actual Size
10 Inches Wide

Strict adherence to your exact specifications is assured when your molded parts orders are placed with American Record Corporation. All molds are made under direct personal supervision from a select grade of tool steel, specially hardened by us, thus insuring accuracy, uniformity and permanence, in every molded product made in our great plants. This organization, with fifty years' background of experience, is qualified to handle your molded parts requirements in any quantity and in any size.

■

Take up your requirements for custom molded parts with American Record Corporation—your most perplexing problems can be quickly and satisfactorily solved by our trained engineering staff.

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Molded Parts *of* PHENOLIC *for* Every Purpose
BAKELITE DURITE LACANITE DUREZ
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NEWS *of the* INDUSTRY

Trade Extension Committee Meets in Detroit

A very interesting meeting of the Committee on Trade Extension of the Molded Insulation Section was held in Detroit on Friday, November 14th. Through the courtesy of the Reynolds Spring Company it was held in their suite of offices in the Fisher Building.

The meeting was called to order by the esteemed Chairman, John Rossiter. In accordance with the practice at most Molded Insulation Meetings, luncheon was very brief but tasty, and business was resumed until 4:30.

The Committee has a very comprehensive program under way and before many weeks it is their intention to outline some real constructive work to create an esprit de corps among the present members as well as non-members of the section.

Present as guests of the committee were none other than the new Chairman of the Molded Insulation Section of NEMA, Mr. L. G. Sylvester, President, American Record Corporation, and Mr. R. C. Gilmore, Jr., General Manager of Plastics Publications, Inc.

The Committee on uniform cost accounting (a most important committee in the section) reports that they are very carefully preparing a Manual which will cover general accounting, cost accounting and estimating. The Committee is made up of accountants from the member companies. Since its activities began in September there has been one general meeting held in New York and a number of sub-committee meetings have been held in some of the various plants.

This group has made excellent headway thus far, and the molders wish to express their sincere appreciation for the work they have done.

MOLDERS' MEETING

A MEETING of the Molded Insulation Section of NEMA will be held on Friday, December 5th, 1930. It will be called to order at 9.30 A. M. at NEMA Headquarters, Graybar Building, 420 Lexington Avenue, New York City.

Willard Dow Heads Chemical Plant

At a special meeting of the Board of Directors, October 21st, Willard H. Dow was appointed president and general manager of The Dow Chemical Company, Midland, Michigan.

Some time ago, the Dow organization constructed the largest modern phenol plant in the world in order to meet the rapid advances made in the manufacture of plastics and molded products.

For eight years Mr Dow has been a member of the board of Directors, and for the past four years acted as assistant general manager.

His intimacy with organization executive policies, strengthened by eleven years of practical chemical experience, fit him particularly well to head this $30,000,000 chemical organization.

Mr. Dow is a graduate of the University of Michigan, having received a Bachelor of Science degree in Chemical Engineering from that university in 1919. His practical work in the plant has made him familiar with the manufacturing processes used in producing more than 150 chemical products. His first act under his new title was to state that "the already well defined policies of progressive research will, I am sure, continue to be the distinguishing factor in The Dow Chemical Company.

G. E. Employees and Company Contribute to Fund

EVERY employe of the General Electric Company, from president to office boy, who is working 50 per cent or more full time, will contribute one per cent of his December wage to the company's new unemployment fund and the General Electric Company will match such contributions dollar for dollar, it was announced here by President Gerard Swope.

Under the rules of the unemployment plan, as originally announced, payments were not to be made for at least six months after its inauguration, which would not be until next January or February, but because of the unemployment emergency it was decided to start relief next month but limit payments to a maximum of $15 per week to employes needing assistance. It has also been decided to consider for assistance employes who may not have contributed to the plan but who are in need of assistance.

Approximately 35,000 employes have been contributing to the plan and on December 1 they will have paid in $350,000.

Aldur Names New Production Manager

MR. W. A. Schneider, of Houston, Texas, has assumed the position of production manager with the Aldur Corporation, Brooklyn, N. Y.

He is a graduate of Rice Institute of the class of 1922, where he specialized in Chemistry. Since graduation, he has been connected with the oil industry, particularly with the Crown Central Oil Refining Corporation and Phillips Petroleum Company.

New Durez Color

PURPLE—a good deep rich purple of excellent molding quality, strength and resistance, to fading, is being offered by General Plastics.

A Message to the Trade Molders

MR. L. G. Sylvester takes the Chairmanship of the Molders Section of NEMA. An executive of broad experience, an able leader, head of a successful company, our congratulations and earnest pledge of support to him.

* * *

Curious, isn't it, the fascination of plastic molding! Rarely does one connected with the industry ever leave it. Daily, do great minds gloat on the fortune easily to be won by pressing the pellets to miraculous shapes.

Can Dun and Bradstreet both be wrong? Where are the profits these artisans should have gained from work well done? Oh, but this work is not so simple as forcing the grease from an Alemite gun. The work is intricate. The required skill of a high order. The relative costs of slight mistakes are enormous. Polished and hardened steel doesn't cut like cheese. The fin too thick, the mold that doesn't fill out, its brother, two of whose twenty pins are a couple thousandths off, all contribute to the risk, and to the initiate bring the deeper wisdom, that the best forethought has its pitfalls. How often do the production costs become the cold grey dawn of the morning after. and turn a sound estimate into a wild piece of optimism. Speaking of optimism, have any of you boys met the prince of optimists who quotes the molded part by just looking at it from the corner of his eye? And speaking of costs, how many really know them?

A child is impressed with the bugaboo story, is easily teased. How near alike is this infant industry! Prices are slashed on mere rumors. Quotations are made on the most flimsy cost data to the utter disregard of real constructive work. While our good friends and customers may temporarily profit by this, in the long run they lose. The possibility of help from the molder to the customer is tremendous. The limit of the field of usefulness of plastics is nowhere in sight. No industry can render proper service, expand or help its customers to expand if it does not make a reasonable profit. Who would put the extinguishing hand of constant losses on this Aladdin's lamp? Read the address of Clarence L. Collens, President of NEMA, delivered at Old Point Comfort, "Self-Restraint in Business." There is no field more fertile for his admirable logic than the trade molders, no better way to encourage the new administration of the Molders Section, than to follow these precepts.

Trade Extension Committee
Molders Section NEMA.

Molded Non-Corrosive Ball Floats

A ball float that does not wear out, is being successfully made of Durez by the Pioneer Radio Corporation of Plano, Illinois.

The float is impervious to corrosion and all of the destructive agents which break down the old fashioned ball cock floats. The "Pioneer" float is particularly noted for its buoyancy and long wearing qualifications.

The material from which the float is made is Durez, the phenolic molding compound. This new, resistant material is said to successfully combat alkalies, moisture, salt and similar destructive agents It may be continually immersed in any type of water;—the alkalies of the Southwest as well as the sulphur of the petroleum fields have no detrimental effect.

Departments of the United States Government have made severe tests of these floats and have approved their use.

Sonora Bankruptcy

ALTHOUGH their combined assets hugely exceed liabilities the Sonora Products Corporation of America and its subsidiary, Sonora Phonograph Co., were petitioned into bankruptcy because an attachment had been made against the company in Michigan. Liabilities of the parent company amount to $736,410 and assets total $5,222,996 while the phonograph company has assets and liabilities of $4,740,395 and $1,646,226. There is a discrepancy in that the parent firm lists as an asset an account of $4,765,611 due from the subsidiary, on an intermediate trading agreement, which is not listed as one of the subsidiary's liabilities.

Great Britain Growing Market For American Domestic Electrical Equipment

GREAT BRITAIN affords a steadily growing outlet for American domestic electric labor-saving appliances. The use of electricity in British homes has shown a phenomenal increase during the past few years and it is probable that this development will continue for some time to come.

Last year exports of domestic electric equipment from this country to the British market were more than double those of 1925.

The Department of Commerce has just issued a study of the British market for electrical domestic equipment which should prove of value to American exporters of this type of merchandise.

Among the subjects discussed in this report are the national "grid" system, the British electrical industry, house-wiring, distribution problems and advertising. The situation in relation to each type of electrical appliance is pointed out.

Copies of this bulletin may be obtained from the superintendent of Documents, Washington, D. C.

Bell Laboratories Chemical Director Speaks

ADDRESSING the monthly meeting of the American Institute of Chemists, R. R. Williams, Chemical Director of the Bell Telephone Laboratories, New York, interestingly explained the contribution of chemistry to the telephone industry and the relation of the chemist and his work in an engineering organization.

"Chemical consideration and chemical activity are involved in almost every process and piece of apparatus used in the Bell System.

"The chief difficulty in the supervision of chemical research and advisory service", Mr. Williams continued, "lies in the almost overwhelming diversity of the problems to be attacked. An important general field of the chemist in relation to the building and servicing of the telephone, is that of insulating materials. In the development of submarine insulation suitable for the trans-Atlantic cable telephone, chemical principles have been interestingly applied. Corrosion and its prevention is another topic of importance. Lead is thought of by many as highly resistant to corrosion. Yet the thousands of miles of cables of the Bell System afford many examples of lead cable sheath by chemical means.

Elgin Capping Machines

THE Elgin Manufacturing Company of Elgin, Illinois reports that certain small adjustments have been made in their machines so that these machines will handle all types of molded caps, automatically, tightening them to the desired tension and not marring the cap in the slightest.

Two descriptive booklets are available—"Adjustable Capper For Small Screw Caps" and "Semi-Automatic Screw Capper".

Boonton Powder Boxes

STANDARD powder boxes in lustrous black or colors are now being offered by the Boonton Molding Company of Boonton, New Jersey in any quantity.

The box measures—outside diameter three inches, circumference eight and five-eighths inches and the height one and three-fourths inches. The covers stay on when the boxes are inverted yet they are readily removed.

New Thropp Equipment

WM. R. Thropp and Sons Co., Trenton, N. J., are distributing a booklet describing machinery for the plastic and rubber industries. Particular emphasis is placed on special safety devices.

Photo, Courtesy of Bakelite Corporation

Two novel molded cigarette boxes. One has four compartments, offering a choice of cigarettes; the other is a dispenser box.

Plastics Viewed By A Wire Manufacturer

Electric wire users required bobbins and spools so Belden set up presses and molded them

By L. L. Stratton

Sales Manager, Belden Mfg. Co.

TO paraphrase a popular song, there's a long, long trail a winding, from the drawing of copper wire to its ultimate application and use in an electrical device. Countless millions of feet of insulated wire are used by the radio, electrical, and associated industries each year, and practically every foot of this wire must be wound upon suitable forms, bobbins, spools, or cores to withstand the severe strains imposed by magnetic action, heat, oil, and moisture. Therefore, the wire manufacturer is vitally interested in the details of each application for which he supplies wire, because the failure of a coil winding in service is often traceable to imperfect mountings or other mechanical details.

It is not strange, therefore, that many years ago the Belden Manufacturing Company, as manufacturers of insulated wire, should also become interterested in plastics. Their sales engineers saw many instances of poor coil winding designs. Many failures were averted by urging the substitution of molded bobbin or core for a part made of wood, metal, rubber, porcelain, or glass.

Beginning with a few hand operated presses, the Beldenmold Division has expanded with additional semi-automatic equipment until it now occupies a considerable section of the new Belden plant at Richmond, Indiana. Early in the year all the molding equipment of the molding department was removed from Chicago, to the new Richmond plant located near the Indiana—Ohio state line, just east of Indianapolis. Built on the edge of an industrial center with ample light and air the new department is a model of modern factory design and efficiency.

This plant also houses the tool department for repairing the molds. These two departments, operating under the direction of the engineering department in Chicago, which is in constant touch with the Richmond plant through private teletype wires, are now an important unit of the Belden Manufacturing Company. The success of this department has justified the early faith of its organizers in the day when plastics was a new art.

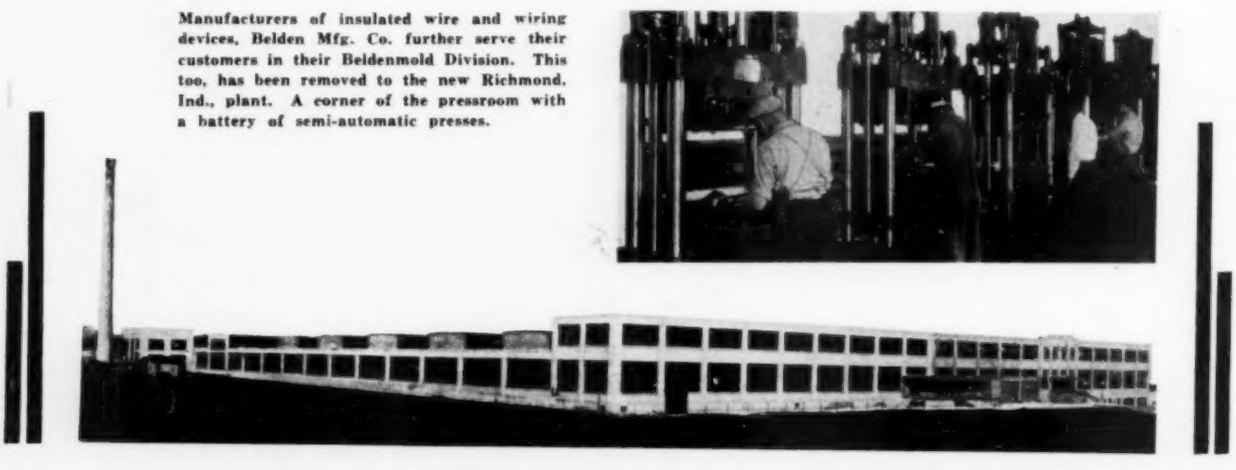
Turbo-Mixer Agencies

TURBO-MIXER Corporation, New York, N. Y., have appointed the National Supply Corporation, of that city to represent them in England, Roumania and the Argentine for all products of their manufacture for the petroleum industry.

Western Engineering Company, San Francisco, will represent Turbo-Mixer Corporation in the section of California north of the Tehachapi Mountains for all products of their manufacture.

John W. Boyer Resigns from Monsanto

Mr. John W. Boyer tendered his resignation as Vice President of Monsanto Chemical Works and it was accepted with regret by the Board of Directors, effective November 1, 1930. Mr. G. Lee Camp was elected vice president in charge of sales.



Manufacturers of insulated wire and wiring devices, Belden Mfg. Co. further serve their customers in their Beldenmold Division. This too, has been removed to the new Richmond, Ind., plant. A corner of the pressroom with a battery of semi-automatic presses.

What *is* Patentable in Plastics?

A concise but lucid interpretation of our patent law, for the guidance of the investor, investigator and inventor

By Charles W. Rivise

This article, which we deem of more than passing interest to everybody in the plastics industry, began on page 566, of the October issue, continued on page 636 in November, closing, in the latter issue, with a discussion of the patentability of an object varying only in size or degree from one of the prior art.

CHANGE in size and proportion was just under discussion, under four sub-headings, namely increase in size, increase in strength, doing something more thoroughly or changing the shape. The next logical heading is

5. Changing proportions of ingredients. Thus in Spill vs. Celluloid Mfg. Co. 21 Fed. Rep. 630,, it was shown to be old to dissolve celluloid in camphor and alcohol. Patent 97,454 which suggested using alcohol of less strength than had previously been used but still of sufficient strength for the purpose was, therefore, held invalid.

Exceptions to the rule are made when the result is disproportionate or unexpected. Thus in the case of Bakelite Co. vs. Brunswick-Balke-Collender Co. 7 Fed. Rep (2nd) 697, it was held that Baekland in his patent 942,809 had exercised inventive ingenuity of a high order in reducing the amount of basic catalyst in the preparation of a phenolic condensation product to less than one-fifth of the equimolecular proportion of the phenol used. The change in amount of basic catalyst made it possible for the first time to control the condensation reaction and stop it at any one of three stages.

Another notable exception to the rule was made in the case of Eibel Process Co. vs. Minnesota & Ontario Co 261 U. S. 45. The evidence showed that the Fourdrinier machine for making paper for many years had been well known and most widely used for making news print paper. By improving the stock and by strengthening the parts the speed of the machine had been brought up to between 500 and 600 feet per minute. But when this speed was attained and maintained for any length of time, the operation showed defects in the paper, described as waves and ripples, which were only overcome by a reduction of speed to less than 500 feet per minute. Eibel's invention was to enable the paper maker to increase the speed to 600 or 700 feet and even more and still produce a good product. To do this he increased the pitch of the wire at the initial point from 15 to 24 inches, giving the stock the added force of the downhill flow, and increased the speed of the machine to correspond, so that the speed of the stock and the speed of the machine were increased cooperatively to from 600 to 700 feet, reaching this efficiency by experiment and actual trial.

Substitution of Material

The third negative rule is that it does not involve invention to substitute superior for inferior materials in making one or more parts of a thing, unless the substitution involves a new mode of construction, or develops new uses and properties of the article not obvious from the change, or where superiority of the substituted article is shown to consist not only in greater cheapness and durability, but also in more efficient action.

Among the many illustrations of this rule may be mentioned:

1. Bakelite micarta instead of hard fiber for noiseless gears. Westinghouse Electric & Mfg. Co. vs. Formica Insulation Co. 270 Fed. Rep. 632.

2 Celluloid instead of glass for housing of pencil sharpener. Boston vs. Automatic 276 Fed. Rep. 910.

3. Phenolic resin instead of rubber coated fabric for connecting strip between rim and solid tire. Ex parte Egerton 1924 C. D. 99.

4. Porcelain or clay instead of wood or metal for door knob. Hotchkiss vs. Greenwood 11 Howard 248.

5. Rubber instead of stone, brick, ets. for tiling for floors or walls. N. Y. Belting Co. vs. Sierer 158 Fed. Rep. 819.

6. Celluloid instead of ivory for piano keyboard. Celluloid Mfg. Co. vs. Tower 26 Fed. Rep. 451.

7. Celluloid instead of glass for watch crystal. Ingraham Co. vs. Silver 297 Fed. Rep. 194.

The fololwing examples illustrate the exceptions to the rule:

1. Substitution of wooden blocks for iron blocks, resting in oil for supporting rim of saw carriage. The wooden blocks by capillarity, supply oil to the bearing surfaces, whereas in the case of iron, an independent means was necessary to supply the oil. Perkins vs. Interior Lumber Co. 51 Fed. Rep. 286.

2. Substitution of thin highly porous sheet of Yoshino paper coated with paraffin for ordin-

ary paper coated with hard wax for stencil or mimeograph paper. The Yoshino paper has sufficient porosity to permit transmission of the ink while the soft paraffin is easily displaced by a writing instrument, as a result of which perfect reproduction of the loop letters was made possible for the first time. A. B. Dick Co. vs. Fuerth 57 Fed. Rep. 834.

3. Use of rubber for artificial gums and teeth, where it appeared that the change in material resulted in a structure wherein the false teeth were firmly and inseparably fitted into the plate in such a manner that no spaces were left between the plate and points of the teeth into which acids or food could be introduced. Smith vs. Goodyear Dental Vulcanite Co. 93 U. S. 86.

4. Sustitution of rubber for the cork, leather and soft metal previously used in steam-gauge gaskets. This invention was based upon the discovery that rubber is less corrosive than the previously used materials.

5. Making fabric for collars and cuffs from two sheets of celluloid and an interposed sheet of muslin, where it appeared that the muslin imparts elasticity and the celluloid gives color and renders washing easier. Patent 200,939 to Canborn in the case of Celluloid Mfg. Co. vs. Chrolithion Collar & Cuff Co. 23 Fed. Rep. 397.

6. Substitution of celluloid for metal for salt shaker top where it was shown that the celluloid, unlike the metal, resists oxidation, can be adjusted on account of its flexibility to irregular shaped vessels and insulates the salt, thus preventing it from caking. Westmoreland vs. Hogan 167 Fed. Rep. 327.

Duplication of Parts

The fourth rule is that it does not constitute patentable invention to duplicate one or more parts of a device. Thus in the case of Slawson vs. Grand Central R. R. Co. 107 U. S. 649, it was held unpatentable to place two glass panes in a fare box so that both the conductor and passenger could see the amount. For the change produces merely a duplication of the old result.

An exception to this rule is made when the duplication of parts modifies the old result in an entirely unexpected manner or produces a new result. Thus, in the case of Goss-Printing Co. vs. Scott 108 Fed. Rep. 253 it was held patentable to bank one printing press upon the other, since the two when so combined, and in their new relation, so coacted as to dispense with angle bars, as well as with a web-deflected course, and made possible a straight-line duplex press.

Omission of Elements

The fifth rule is that it is not invention to omit one or more parts of an existing thing, unless the omission causes a new mode of operation of the parts retained, or results in a substantial simplification of construction or rearrangement of the remaining elements, whereby the same or a better result is obtained by a less number of parts. Obviously, if a man discovers that he can eliminate one or more parts of a machine or process and still get the old result, he is entitled to a patent protection. But, if the omission of the element also eliminates the function of the omitted element and does nothing more, no patentable invention is present.

Making Device Portable

The sixth rule is that it does not constitute patentable invention to make an old device portable. The advantage and convenience arising from making a device portable are usually so obvious that their perception and appreciation cannot be held to involve an exercise of the inventive faculty. However, in a very small percentage of cases, it happens that the change brings about new and unexpected results. In such a case the change may be patentable.

The seventh rule is that no invention is involved in substituting equivalents in an old device or thing. An equivalent is usually defined as an element that performs the same function, in substantially the same way to produce substantially the same result as that produced by the element replaced. Terms and nomenclature do not determine the question; neither does form or shape.

1. A bolt and a screw were held to be the equivalents in Root vs. Sontag 47 Fed. Rep. 309.

2. Ball bearings and roller bearings were held equivalents in Coates vs. Boker 119 Fed. Rep. 358.

3. A crank is usually considered equivalent to a cam or an eccentric.

4. A chain and sprocket are equivalent to a shaft and a pair of gears.

5. Dry lime hydrate for retarding the setting of Plaster of Paris was held equivalent to powdered marble for the same purpose in the case of King vs. Anderson 90 Fed. Rep. 501.

6. Porcelain, argillaceous earth, etc. were held to be equivalents of kaolin in a plastic composition, containing kaolin, shellac and coloring matter. Welling vs. Crane 21 Fed. Rep. 707.

7. Copper sulphate was held to be the equivalent of previously used metal salt hardening agents in plastic paving compositions containing a finely divided filler, a mineral asphaltic binder and a hardening agent. Western Willite Co. vs. Trinidad Asphalt Mfg. Co. 16 Fed. Rep. (2nd) 446.

Change of Location

The eighth rule is that no invention is involved in merely changing the relative location of parts of an old device.

As examples of changes of location that were held unpatentable may be mentioned:

(1) Changing the angularity of two shafts which are operatively connected by gearing.

(2) Reversal of parts such as placing cutting knife behind instead of in front of moistener. National Binding Machine Co. vs. Harper Paper Co. 242 Fed. Rep. 939.

(3) Reversal of parts such as making the type bed stationary under traveling cylinders, in-

stead of making the cylinder stationary and the type bed movable under it. Duner Co. vs. Grand Rapids R. Co. 171 Fed. Rep. 863.

If the change in location is not merely arbitrary, but is accompanied by some unexpected or unobvious result, the Courts will uphold the patent. Thus in the case of Hoyt vs. Horne 145 U. S. 302, it appeared that prior to Hoyt's patent No. 303,-374 dated August 12, 1884, rag engines were usually constructed with a vertical midfeather. Hoyt found that by placing the beater roll in one end of the vat and providing a horizontal midfeather extending from the beater roll to the other end of the vat, an unexpected increase in beating action was obtained, in that the fibrous material and liquid were carried from the lower section between the knives and delivered over the top of the beater roll into the upper section. This change was therefore held patentable.

Making An Element Adjustable

Rule 9 is that it is not patentable to make an element adjustable if no unexpected new result is produced by the change. Thus in the case of Houser vs. Starr 203 Fed. Rep. 264 it was held not to constitute invention to make a tool adjustable in four directions instead of two.

Making Parts Integral or Separate

The tenth rule is that there is no invention in making two parts integral that had previously been separate and vice versa, unless the new integral part, or the separate parts, perform some new or additional function that is unobvious from the change. It has been held that an increase in strength is not such an additional function as to create an exception.

Double Use

The eleventh rule is that the application of an old device or process to a similar or analogous subject, with no material change in the manner of applying it is not patentable even if the new form of result has never before been contemplated.

This rule, often referred to as the rule of double use, is tied up with the question of analogous art. A man is expected to know of a solution in his own and analogous arts, but not in remote arts. Hence, it may involve invention of a high degree to take over a device from an entirely unrelated art and apply it to produce a different result, even if no material change is made in the construction.

Illustrations of cases in which the adaptations were held to be mere double uses are as follows:

1. Punching metal and punching paper. Conley vs. King Bridge Co. 175 Fed. Rep. 79 in which the Court said that a man would naturally consider machines in other arts adapted for punching materials of like form.

2. A method of cleaning rubber and a method for cleaning clay. In both processes the steps were the same, namely, reducing the material to a plastic state and forcing it through a strainer. Patent 642,814 in the case of Cowen vs. Boston Woven Hose & Rubber Co. 214 Fed. Rep. 806.

3. Making artificial bands, veins, streaks, etc. in celluloid was held to be analogous to producing the same effects in cement. Hence in the case of Arlington Mfg. Co. vs. Celluloid Co. 97 Fed. Rep. 91, Patent 546,360 to Stevens was held invalid over Patent 211,860 to Mehling.

4. Lifting sheets of paper by suction when it was old to lift buttons, pills and nail heads in that manner. F. R. Sterns Co. vs. Russel 85 Fed. Rep. 218.

5. Applying process of coating paper, metal, fabric, glass, etc. to shoes, since the operation was merely coating. In re Braselton 273 Fed. Rep. 759.

6. Transfer and adaptation of a machine for coating glass and emery paper to the art of coating paper with gelatin emulsion for photographic use. Eastman Co. vs. Getz 84 Fed. Rep. 458.

Some changes in which the new adaptation was held to be more than a double or analogous use and hence patentable are as follows:

1. Cylinder for polishing wood and cylinder for disintegrating clay. Potts vs. Creager 155 U. S. 597.

2. Tanning leather and dyeing fabric. In both the dyeing and the tanning processes the material was treated with an acid which was then reduced to oxide by chemical reduction. Tannage Patent Cases 70 Fed. Rep. 1003 and 93 Fed. 811.

3. Grinding buttons and grinding lenses. Bisight Focal Co. vs. One-piece Bifocal Lense Co. 259 Fed. Rep. 275.

4. In the case of Keasbey and Mattison Co. 143 Fed. Rep. 490, molding tubes out of a plastic compound of magnesia and asbestos for use in insulating steam pipes was held non-analogous to molding paper pulp, clay, brick, tobacco, cotton or hay.

In many cases it has been held that the necessity of considerable change in the old device to adapt it for its new purpose is evidence of invention. Thus in the case of Potts vs. Creager supra the fact that the wood polishing machine had a series of peripherally extending glass strips or bars which had to be replaced by steel bars to produce an operative clay disintegrator was the decisive point.

The argument that considerable change was necessary to adapt the old device to its new use was relied upon in the case of Eastman Co. vs. Getz mentioned above. In this case it appeared that to adapt the glass coating machine to coat paper it was necessary to increase the distance between the coating and driven rolls to give more time for the drying and setting of the gelatin emulsion. The Court, however, held this change to be one that would naturally occur to a skilled mechanic when confronted with the problem of applying an emulsion of a different consistency from that formerly employed.

Combination and Aggregation

The twelfth and last negative rule is that aggregation or lack of combination is not patentable. Restated in non-technical language, the component parts or elements of a device or process must coact with each other in such a manner as to produce a unitary result which is not merely the aggregative effects of the individual elements.

When operations or devices are brought together and united, one or the other of two results must follow. Either each element remains unchanged in function or effect, or each one performs additional functions and produces additional effects due to their action upon each other or their joint action upon the common object. The former union is an aggregation or a mere collacation of elements and is not patentable.

As examples of aggregations may be cited the following cases:

1. Eraser and lead in a lead pencil. Reckendorfer vs. Faber 92 U. S. 347.

2. Two machines on a single bed plate for performing successive operations on a single piece.

3. Plurality of tools on a turrent head of lathe for tire making. Thropp Sons vs. Seiberling 264 U. S. 320.

4. Adding a second lock to bag already having one lock. Wertheim vs. Lefkowitz 232 Fed. Rep. 474.

If several elements are brought together so that additional functions are performed and additional effects are produced, the union is a true patentable combination. In such a combination the final result is unitary and due to the joint coaction of all the elements.

An excellent example of a true combination is the process described and claimed in Patent 1,316,120 to Sutherland, which was held valid in the decision of Michigan Carton Co. vs. Sutherland Paper Co. 29 Fed. Rep. (2nd) 179. The method calls for sealing waxed cartons by dewaxing, gluing and press-

ing the surfaces together. This process was held patentable though each one of the steps was individually old. The invention resided in bringing them together so that they cooperated to produce a new and unitary result.

It often happens that the elements themselves are new and patentable. In such case patent protection may be secured on both the combination and on each of the new elements. However, it must be emphasized that if a new element is introduced into an old combination, a patent cannot be secured for the combination unless the new element coacts with the remaining elements in a different manner than did the replaced element to produce a modified or different effect. In other words, improving merely one element of a combination does not ordinarily create a new combination in a patentable sense.

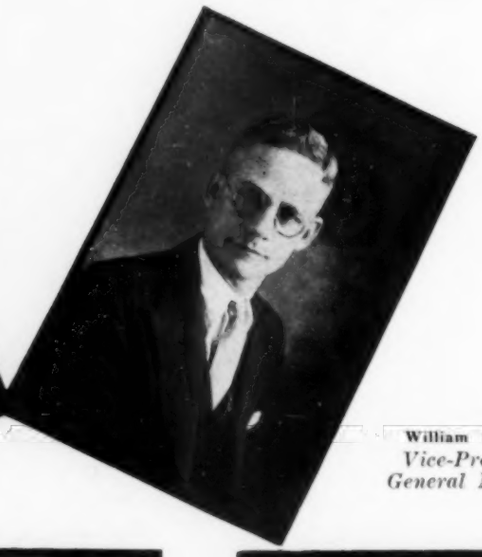
Summary

From what has already been said, it may be laid down as a general rule that a new and useful invention or discovery is patentable if it relates to patentable subject matter and produces an unobvious or unexpected result or an old result in an improved and unobvious manner.

If there is any doubt in the mind of the Court that invention exists in a particular case, the doubt will usually be resolved in favor of the patentee. This is especially so if he can show that his invention satisfied a long felt need and solved a problem that existed for years in spite of all that prior workers in the art claimed to have accomplished. It often helps also to show that the teachings of the patent were regarded with skepticism when first disclosed to workers in the art and that after its utility was demonstrated, the invention went into immediate use and achieved great commercial success.

Executives Behind a Molding Plant

Maurice C. Bachner
President



William L. Kelly
Vice-Pres. and General Manager

Marcel F. Bachner
Vice-Pres. in charge of moulding production

Fred J. Bachner
Secretary and in charge of tool work

Louis H. Bachner
Auditor

Edward F. Bachner
Treasurer and in charge of engineering and estimating

H. D. Payne
Advertising Manager

Confidence and Courage Build a Successful Molding Business

Observations of a manager of Mid-West plant which is among the best in that part of the country

By William L. Kelly

Vice-President, Chicago Moulded Products Corp.

IN the very early days, the moulding industry was kept carefully veiled in mystery. All outsiders, even customers were refused entrance into a moulding plant without special permission from the head of the concern. Everyone, unless specially guarded, was kept well away from the presses, and was told that there was grave danger of being killed from the explosions. The art of moulding was considered to be not only a secret but a very hazardous art.

There was perhaps some foundation for this belief, for I remember several years back, when in charge of a certain plant that we had to guard our men against explosions of materials and the popping open of moulds. These explosions were frequent in the course of a day's work—especially when using a wooden core in the making of some part. I have frequently seen part of a mould fly up and hit the ceiling a thud that could be heard throughout the entire plant.

Customer's Confidence

When I took charge of this plant, one of my first moves was to not only make it a safe place but to open up our plant not only to our customers but to our competitors. I felt that if our customers gained some knowledge of the moulding art they would be more receptive to its use in their products. I also felt that if we were doing something in our plant that might help our competitors, it would naturally be of help to the entire industry.

This move very quickly led to a much better understanding among those engaged in the moulding industry, and I know of no plant today, where a competitor is not made welcome and given all possible information.

It is not so very many years ago that the price of material was so high as to make it the major item in figuring the cost of the finished piece. Today, of course, the cost of material has been reduced until it just about equals labor costs in the average run of parts. And so, difference in overhead is practically all that accounts for any difference in quotations on the same part.

Passing on Savings

Although most business is taken today on open bidding, we have found that by taking a new customer into our confidence, showing him our plant and facilities for handling his work, going over his job in detail with him, and if possible demonstrating to him how by making minor changes or short-cuts, his part or piece can be made more economically without affecting its utility, we make a steady customer of him. As a matter of fact it is in this way that we are often able to lower the cost so materially that our customer can pass on a saving to his customer.

I believe that any moulding concern, if once having made contact with a customer, will follow out this plan, they will continue to hold that customer indefinitely.

In fact I believe that a good measure of the success I have and am now enjoying in the moulding industry is due to trying to build with an "open mind", and to be always ready to give and take with a prospect or customer.

Oftentimes we find that after we have gotten a job into production we are able to reduce the cost of manufacture, and I have made it an invariable rule in such cases to pass this saving on to the customer. Such savings are of course greatly appreciated by the customer, and he will often go out of his way to recommend our company to other prospects.

On the other hand, should certain unforseen difficulties arise in producing a certain part, if we have taken our customer into our confidence at the start, we find him much more receptive to the idea of paying more for it than originally figured.

There is little to be gained by any of us if we only acquire as customers, and through price cutting, those who are now using moulded parts. If we all expect to grow and thrive it can come only by adding new users of moulded parts to our present list of customers. And it is only by fair treatment to those who have made it possible for us to advance this far, that we will be able to go still further.

Losses Eliminated

Our company has enjoyed a rather remarkable growth during the past five years. When I became associated with the Chicago Moulded Products Corp. as General Manager, the company had only losses to show. I immediately made a number of somewhat radical changes not only in manufacturing methods but in sales methods as well. That these changes were warranted is borne out by the fact

(*Continued on page 729*)

An Up-to-Date Treatise on Synthetic Resins

A review of the recently issued German text on artificial resins, containing a concise resume of what has been made been made out of them

By Carl Marx
Editor, Plastics

As the usefulness of any worker in a field such as plastics, where scientific principles apply, depends much on his knowledge of contemporary publications, we deem it a distinct service to our readers to present from time to time comprehensive reviews—rather criticisms—of new works—both in English and the more accessible foreign languages.

WITH the sole exception of Carleton Ellis' "Synthetic Resins and their Plastics" published seven years ago, there has not been a complete and comprehensive treatise on this most important subject. However, this lack has now been supplied, at least for those of us who can read technical German, by a work entitled "Die Künstlichen Harze" (The Artificial Resins), by Dr. phil. Johannes Scheiber and Dr. phil. Kurt Sändig, the first named being a Professor at the University of Leipzig, Germany.

With usual German thoroughness and efficiency, the authors have covered the entire difficult subject of the preparation and chemistry of the artificial and synthetic resins, taking into consideration not only the literature but also, which is much to be praised, the patent specifications of the whole world. Thus, in a single volume, one has a veritable library of information on all of the synthetic resins down to date (the book appeared late in 1929).

Scope Covered

The work is intended not only for the thoroughly skilled chemist, but for the user and producer of the products as well. The first part of the book consists of 166 pages of the theoretical aspects of the properties of resins, and the reasons underlying resinification in general. Particular attention is devoted to the resinifying polymerizations of different classes of organic compounds. The theory of resinification, such as is related to polymerization through double ethylene linkages, carbonyl-group linkage, azomethine and ethine groups, and the nitrile groups, is fully and authoritatively taken up.

Various substances that lend themselves to condensation and polymerization are taken up in detail. Pages 102-166 deal with the resinifying condensations, such as those that take place with the elimination of water; condensation of aldehydes other than formaldehyde with phenols; and similarly those of the ketones.

The condensation of alcohols and phenols, oxy- and hydroxy-acids and the like; the reactions leading to the formation of oxygenated resins, and the formation of element-convertible products are discussed.

Part C, of the work, termed "Special Part" consists of an enumeration of the properties, manufacture and testing of the technically important artificial and synthetic resins. Special chapters are devoted to the coumarone resins, their preparation, properties, uses and testing. About one hundred pages are devoted to the phenol-aldehyde resins alone, which the authors classify into Novolaks and Resoles. The further discussion, comprising over 200 pages, relates to copal substitutes, various phenol-aldehyde resin derivatives, including special chapters on phenol-furfural resins, phenol-acrolein resins and the like.

Detection and testing of the phenol-aldehyde resins is very thoroughly discussed. The newer urea-formaldehyde products are also included, though but eight pages are devoted thereto. The comparative novelty of this branch of the industry is of course the cause of this comparative slight to what promises to be a very important branch of the synthetic resin industry.

Testing Methods

As an appendix, the authors reproduce the official German testing methods for the synthetic resins and their products; which are those of the "Verband Deutscher Elektrotechniker", being officially adopted October 1, 1924. These differ somewhat from the tests prescribed by the American Society for Testing Materials, but afford a very interesting comparison with our own standards in America.

What makes the book of particular value, especially from the viewpoint of those engaged in research, and in the inven-

tion and development of the newer synthetic resins, is the fact that every statement in the book is supported by a foot note pointing out the authority for the statement. These footnotes contain references to patents and to literature, books etc.

The utilization of the synthetic resins is given in considerable detail. A very interesting table is reproduced on page 281 giving an alphabetic list of all the products that have actually been made from "Bakelite" in America and in Europe. A reproduction of this list will appear in an early issue of PLASTICS, and comprises about 250 separate **uses.** When one considers that this industry is really still in its "baby shoes", the great future that undoubtedly will be its own can be realized.

Comprehensive Patent Index

As a particular aid to those looking for specific information, there is appended to the work a complete patent number index of German, British, United States and all foreign patents mentioned in the work. We strongly recommend it in connection with the review by Dr. Aladin that has just been completed in the pages of PLASTICS. As an indication of the extent covered, this part of the index alone covers 14 pages. There are also two other splendid indexes, one of authors and inventors, and the other of subjects.

The work is published by the Wissenschaftliche Verlagesgesellschaft m.b.H. at Stuttgart, Germany, and sells in Germany at 28 RM for the bound, and 26 RM for the paper edition. The book can be obtained in the United States through our Book Department, or through B. Westerman & Co., New York. We strongly advise all those in the resin industry to obtain a copy. It is hoped that before long an English translation will be available.

Plastics Industry Abroad

(*Continued from page 705*)

lin. New vigor seems to have arisen from this change: A very readable magazine, treating synthetic resin research generally and the Rommler materials especially, is issued at regular intervals. Their products are Heliosit A, B, and I (insulating resins), Resistan C and E (heat resisting), and Haresplatten material, an insulating material in sheets. Their newest development is Alboresin, an aminoplastic molding material in all colors, light-fast and dyefast. Dr. H. Ripper, who shared pleasure and trouble with F. Pollak in Vienna for many years, is now affiliated with Kontakt-Rommler.

Pollak in Austria

Speaking of F. Pollak, it would be appropriate to mention this old established concern as the most representative manufacturer of synthetic plastic in Austria. His patents and research efforts date back to shortly before the war[3], and his "Juwelith" is practically a generic name for the cast type of plastic materials among the handcraft workers on the hills and plains of Austria and Czechoslovakia just as much as Bakelite for molding, or Aspirin for a headache.

As long as we are mentioning these cast phenoplasts again, let us finish the job and line up so memore of the younger concerns in German: Saeure Schutz-Ges., Berlin, with an excellent acid-proof material for the chemical industry (Haveg and Havegit); Deutsche Rohstoff Industrie in Augsburg (Utilit, Albolit and Pantolit), Dr. Stern, Chem. Fabrik, Berlin, Chem. Fabrik Schwalbach. Furthermore, Wedig and Reuss in Eilenburg, manufacturers of Koraton, extensively used in the novelty trade, for billiard balls, etc., and Chem. Fabrik Albert, Ammoeneburg a Rh. Known the world over by the Albertol resins (Amberol in U.S.A.). Al-

bert's entering the cast phenolic plastic field dates back a year or two only, but judging by their remarkable success in the lacquer and varnish gum field, we do not doubt that prosperous times are ahead of this company.

Vinyl Resins

The thermoplastic vinyl esters are forming the border line between plastics and gums. Some of them are designed for the use in the lacquer field only, some of them intended to be used as plastics itself or binders for plastic materials. When the Chem. Fabrik Griesheim-Elektron (an I.G. concern), came out with the first batches, there was hope of giving the world a new and non-burning substitute for nitrocellulose and celluloid. The Hoechster Farbwerke (also an I.G. concern) entered the same field and "Mowilith" is an established fact nowadays. But the price and the properties do not allow as yet a promise of wide use for this material. The raw materials[4] being vinyl acetate, and others, sometimes in combination with acetaldehyde[5], the latter one being used by the Canadian Electro Products Co. In the United States, this field is being developed by the Carbide & Carbon Chemical Co. (Vinylite) and the Naugatuck Chem. Co. (Victron). As it looks now, the vinyl derivatives will not have such easy sailing as the phenolic resinoids had, but if they finally "arrive," they will make it still harder for the older long established plastics.

Casein Solids

The trade-name "Galalith" is often used in a similar way as one would use "Bakelite" for a certain type of product. Casein products had, up to now, the disadvantage of being too hygroscopic, and this fact made them lose many a customer in spite of the brilliant scale of color combinations. The raw material, casein, being comparatively cheap, lost out by its

time-robbing necessity of seasoning for months in formaldehyde baths, which increased the overhead and forced the customer to plan and order a long time in advance.

The research laboratories of all these imitation horn factories are busy trying to overcome the lyophilic character of these compounds by combining them with water repelling agents and simultaneously are looking for some improvements which may enable them to produce a hardening molding powder. Combinations of casein with materials which form thermo-setting carbamide formaldehyde compounds, seem to be favored among the inventors. Nevertheless, the Internationale Galalith Gesellschaft in Harburg A. E. is having their share in the trade as well as the English and Austrian competitors in this dominating casein triangle, the Erinoid Ltd. and the Akalit-Kunsthornwerke A.G. Let us mention some more manufacturers and trade-names of the West European sphere, where for a while casein products were much appreciated.

Editor's Note. To be continued from this point in the January issue.

Confidence in Molding

(*Continued from page 721*)

that our four presses have grown in five years to forty, and that today, ours is one of the leading moulding plants in the West. A little over a year ago we had to double our plant capacity, and even then were obliged to frequently operate on twenty-four hour shift. If we continue to progress as rapidly as we have during the past year, we will very shortly be obliged to seek new and larger quarters.

In addition to our modern and well laid-out moulding department, we have an excellent tool room which is very efficiently managed by experienced executives. We are one of the few concerns equipped to handle the entire moulding job—that

is to build the mould and operate it in our own plant.

All of our executive officers have been trained from the ground up in the special end of the business they are now serving.

Our President, Mr. Maurice C. Bachner, is a skilled mechanic, with wide financial and sales experience which fits him for taking general charge.

Our Vice-President and General Manager, Mr. William L. Kelly has charge of all costs, sales, plant management and supervision in general.

Vice-President Marcel F. Bachner is in charge of toolroom production and moulding methods.

The Treasurer, Mr. Edw. F. Bachner, is also the head of the engineering and estimating department and is assisted by a corps of trained engineers.

The Secretary, Mr. Fred J. Bachner, skilled in precision tool work is in charge of that department.

Auditor, Mr. Louis H. Bachner has charge of the accounting and credits.

Our Advertising Manager, Mr. H. D. Payne has charge of all publicity.

Although each man has absolute charge of the department of which he is the head, they are always open to suggestions from others outside their department, and as these suggestions are never made with a spirit of criticism, we have harmony and loyalty.

Our volume of business has had steady increase from year to year, and even during the past year of so called "depression", we have made progress.

Although the moulding industry as a whole has had remarkable growth during the past five years, I believe that the next five years will show still greater advancement both in volume of business as well as in the art itself.

There is all ready a better understanding between those now engaged in the moulding industry than ever before, and this has always proven to be a

potent factor in the advancement of any particular industry. Much credit is due "Plastics & Molded Products" for bringing about this better understanding and I feel that we should do all we can to assist Mr. Gilmore and his staff in this work.

Self Restraint in Business

(*Continued from page 700*)

necessary, and, in fact, to all the facts that are necessary, for the intelligent conduct of his individual business.

Such a program does not negative the law of supply and demand and adjustments in price levels will still follow the competitive demands of that law and any basic changes in cost, but under any conditions of supply and demand or of cost, prices will be more stable. It is the American plan of price stabilization based on freedom of individual action, influenced only by publicity, accurate facts, intelligence and self-restraint.

L. G. Sylvester Is New NEMA Section Chairman

(*Continued from page 693*)

Glendale, California. Mr. Sylvester is a lover of all sports and he is particularly fond of fishing and hunting.

It was natural for Mr. Sylvester to follow the thermoplastic business as his father, P. L. Sylvester, now deceased, was a pioneer in the molding field, entering into the manufacture of molding shellac composition over fifty years ago when this business was in its infancy. P. L. Sylvester was a manufacturer and inventor of note having many valuable inventions to his credit, being the originator of many practices now in present day use, such as the heating and cooling of molds by channels in the moulds through which steam and water were alternately passed, the present method of sinking or hobbing under great pressure mold cavities in soft steel from a hardened steel master hob.

Technical Abstract Section

A Concise Review of Patents and Literature

Process for Manufacturing Objects From Nonconducting Materials. Alfred Uhlmann, of Berlin- Steglitz, Germany, assignor to Albert T. Otto & Sons, of New York, N. Y., V. S. P. 1,768,869; July 1, 1930.

The process for the production of bodies from non-conducting substances which includes the step of placing the substances in a finely subdivided state and under compression in a high frequency electric field, whereby the micro-arcing between the particles effects cohesion of the substances, and without the direct passage through the substances of electric current producing said field.

Process of Producing Resins. Jacque C. Morrell and Gustav Egloff, of Chicago, Illinois, assignors to Universal Oil Products Company, Illinois, V. S. P. 1,766,927; June 24, 1930.

A process of making resins which comprises subjecting a mixture of polymeric hydrocarbons and a phenolic body to an elevated temperature below that which would prevent reaction from taking place in the presence of an oxidizing gas and containing the treatment until the material has reached the desired viscosity, then allowing the finished product to cool.

Furfural Resin Composition. Carleton Ellis, of Montclair, New Jersey, V. S. P. 1,771,033; July 22 1930.

The process of making a resinous material which comprises reacting on one mol. of furfural with at least one mol. of a phenol capable of resinifying therewith, in the presence of a fixed alkaline substance at a temperature substantially above the expulsion point of water, arresting the heating when the furfural and phenolic body have become largely converted into a resin and incorporhexamethylenetetramine and a small ating the resinous material with amount of a fixed alkali.

Method of Making Substantially Anhydrous Finely-Divided Synthetic Resins. Emil E. Novotny, of Philadelphia, Pennsylvania, assignor to John Stogdell Stokes, of Huntingdon Valley Post Office, Pennsylvania, V. S. P. 1,771,140; Juuly 22, 1930.

In the production of synthetic resins relatively low in volatile constituents the step which comprises, diving the resinous body into fine particles and washing said particles in water to remove substantial quantities of volatile constituents from the particles and preventing their fusion into large homogeneous bodies.

Method of Making Substantially Anhydrous Finely-Divided Synthetic Resins. Emil E. Novotny, of Philadelphia, Pennsylvania, assignor to John Stogdell Stokes, of Huntingdon Valley Post Office, Pennsylvania, V. S. P. 1,771,139; July 22, 1930.

The herein described method which comprises cooling a sludge-like synthetic resinous mass to produce a grindable substantially solid mass, then grinding the cooled mass into small particles, and then maintaining said particles in motion while subjecting the same to the drying action of an air current until the resinous particles are non-cohering.

Paper Product. Emil E. Novotny, of Philadelphia, Pennsylvania, assignor to John Stogdell Stokes, of Spring Valley Farms, Huntingdon Valley Post Office, Pennsylvania, V. S. P. 1,771,138; July 22, 1930.

A paper like body having incorporated therewith a resinous reaction product of but two substances, namely: xylenol and formaldehyde, said product comprising a potentially reactive, fusible, resinous compound.

Polymerization of Ketone-Formaldehyde Condensation Products. Charles E. Burke, of Wilmington, Delaware, assignor to E. I. Du Pont De Nemours & Company, of Wilmington, Delware, V. S. P. 1,755,099; April 15, 1930.

1. Process which comprises polymerizing a ketone formaldehyde condensation product in the presence of an organic amine.

2. Process which comprises polymerizing a ketone formaldehyde condensation product in the presence of urea.

3. Process which comprises polymerizing an acetone formaldehyde condensation product in the presence of an organic amine.

4. Process which comprises polymerizing an acetone formaldehyde condensation product in the presence of urea.

5. Process which comprises polymerizing an acetone formaldehyde condensation product with urea, in the presence of nitrocellulose and alcohol.

6. Composition of matter which contains a cellulose derivative, a ketone formaldehyde condensation product and an organic amine.

7. Composition of matter which contains a cellulose derivative, an acetone formaldehyde product and an organic amine.

8. Composition of matter which contains nitrocellulose, an acetone formaldehyde condensation product, urea and alcohol.

Porous Organic Material. Erik Christian Bayer, of Copenhagen, Denmark. U. S. P. 1,777,247; Sept. 30, 1930.

The method of producing a hard, porous, organic, insulating material from a solution of organic material which consists in incorporating in said solution gaseous bubbles made from a bubble maintaining substance of the group including vegetable glue, gelatine, soap solution, caseinates or saponines and after the bubbles are intimately mixed with the solution, causing the said organic material to harden by adding a material that will chemically combine with and harden it before the bubbles collapse and while the bubbles are so mixed therewith.

A hard, porous, coherent, insulating, organic material comprising a body of material from a group of materials including glue, chrome-gelatine, caseinates or albumins, said material being impregnated with gaseous bubbles having a bubble sustaining material to stiffen the bubbles.

Process for the Condensation of Difficulty Soluble or Insoluble Carbohydrate Ethers Into a Soluble State. Otto Leuchs, of Elberfeld, Germany, assignor to I. G. Farbenindustrie A.-G. U. S. P. 1,767,382; June 24, 1930.

Example 1.

1 part by weight of an ethyl cellulose, having a content of ethoxy group of 47 to 48%, which only undergoes swelling in benzene or in a mixture of alcohol and benzene, is introduced into a mixture of 3 volumes of alcohol, 3 volumes of water and 1½ volumes of concentrated sulphuric acid and thoroughly stirred. At first the mass simply swells up, but after a longer or shorter time, depending on the temperature of the mixture— for example at room temperature in the space of several hours —complete solution is effected. At this point, advantageously after a previous test precipitation, the solution is precipitated with water and the product is washed and dried. After this treatment the cellulose ether has become readily soluble in benzene and benzene-alcohol. From the solutions in these solvents films are obtainable possessing normal clearness, strength and pliability and completely equal to those obtained from the known soluble cellulose ethers. By prolonging the action of the acid (12-24 hours) the solubility is increased more and more, viscosity of the solutions of the product decreasing with increase of solubility.

Cashew Nut Composition. Mortimer T. Harvey, of East Orange, N. J., assignor to the Harvel Corporation of Newark, N. J. U. S. P. 1,771,186; July 29, 1930.

1. Sulphurized cashew nut shell liquid.

2. As a new article of manufacture, material which is the heat reaction product of cashew nut shell liquid and sulphur.

3. The method which comprises heating cashew nut shell liquid together with sulphur and thereby securing a reaction between them.

4. A material, formed by heating cashew nut shell liquid and sulphur and having characteristics of rubber which has been heated with sulphur.

Cellulose Ester Composition. James F. Walsh, Harry E. Smith and Amerigo F. Caprio, assignors to Celluloid Corporation. U. S. P. 1,772,529; Aug. 12, 1930.

1. A solid plastic composition consisting substantially of one hundred parts pyroxylin, twenty parts camphor and ten parts dibutyl phthalate.

2. The process of making a pyroxylin compound comprising a composition of pyroxylin, camphor and a simple alkyl ester of phthalate acid where the alkyl radicals contain less than six carbon atoms, which consists in mixing ten parts dibutyl phthalate with one hundred parts hydrous pyroxylin, dry basis, and afterwards removing the water therefrom, and then adding twenty parts camphor dissolved with solvents.

Phenol-Carbohydrate Resin. James McIntosh, of Norristown, Pa., assignor to Continental-Diamond Fibre Company of Newark, Del. U. S. P. 1,753,030; Apr. 1, 1930.

A synthetic resin consisting of a hard, dense, lustrous, infusible, insoluble resinous solid constituting the final product of the reaction of a phenol and starch.

A synthetic resin consisting of a hard, dense, lustrous, infusible, insoluble resinous solid prepared by further heating the initial condensation product resulting from the reaction of a phenol and starch in the presence of a catalyst.

The process which consists in causing starch and a phenol to react to form an initial condensation product, adding hexamethylenetetramine to said product, and heating the mixture to cause the condensation product to assume its solid, infusible form.

Process of Treating Fabric With Cellulose. Robert R. Fulton, of Pittsburgh, Pa., assignor to the Koppers Company. U. S. P. 1,767,663; June 24, 1930.

The process of treating fabric which comprises spreading cellulosic pulp over the fabric and then effecting a gelatinization of the pulp.

The process of treating fabric which comprises spreading cellulosic pulp over the fabric, pressing and drying the fabric and pulp, immersing the dry material in a solution of calcium thiocyanate and formaldehyde, removing the treated fabric and pressing it to remove excess solution, allowing it to stand until gelatinization of the pulp occurs, removing the dry material in a solution the coated fabric.

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And Now, In Closing:

ALL the big men in the country are now starting their talks and articles with the word "fundamentally" . . . which leads one to wonder what became of last year's word "basically" . . . . Production has declined more than usual in the past month . . . so has profit . . . ditto contracts . . . and ethics . . . Looks like we were wrong in the prophecy we made regarding increased business for November . . . Casein business has picked up a little, though . . . Not only are there six airplanes used for business travel in the industry, but there is a baby blimp also . . . used by Bird and Son, who do not consider plastics as a major operation . . . And speaking of operations, one of the big, well known molders just had one . . . In the opinion of engineering officials, television is still impractical . . . which is a good thing for the plant superintendents in the powder game . . . unemployment is larger than ever, and one eastern molder has almost stopped production . . . Still, if everybody worked all the time nobody would have an opportunity to buy anything . . . The best sign of returning confidence: only 14 new trade-marks (for materials) registered in thirty days! . . .

WE are adding a little humor in the following quotation from Robert Littell writing in the New Work *World* for November 14th. Yet it is humor set in thought, with a problem for our industry. Mr. Littell is speaking of the perishability of newsprint and pulp and then continues:

"The same tragedy faces, so I am told, all the records of our time that are made in film form. The celluloid, or whatever it is, begins to disintegrate, rot away and deliquesce within a very few years. From the point of view of posterity, this is probably a far more serious loss than the loss of all our newspapers and magazines and 99 per cent of our books.

We do not realize the loss, for what the news films record are things we have seen or could have seen, for ourselves. How posterity will feel when the all-talking, all-moving chronics of 1930 are found to have disintegrated may be imagined by supposing that the camera men of 1777 took several reels of Washington at Valley Forge but neglected to print them upon lasting material. We owe it to posterity, we owe it at any rate to our own self-respect and self-importance, to invent a film that will preserve what is happening now that can be sealed up and resurrected and laughed at or wondered over by our great-grandchildren. I suggest that some of the multi-millionaires who build themselves yachts and subscribe fitfully to societies for the prevention of children or animals take it upon themselves to endow a research laboratory for the preservation of a fast-melting history.

I further suggest the formation of a body of enlightened public citizens to be known as the all-American committee on immortality. Its duty will be, in the first place, to devise means whereby a wood pulp and celluloid civilization can guarantee itself against total extinction, and to erect libraries and museums wherein to preserve, in imperishable rag and metal, our books and films. Its second duty will be the much more difficult and dangerous one of choosing fit candidates for this immortality."

THERE are some mighty interesting editorial pages in this month's issue. Not the least attractive feature of every article is the writer's knowledge of his subject. It pains us to see so many mistatements on the Plastic industry in contemporary columns, but it is surprising to find two usually reliable journals—American Machinist and Product Engineer — report, in a joint survey, that "In 1918 industry consumed 5,000,000 pounds of plastics. Last year 36,000,000 pounds were used in making molded parts utilized in 102 types of products". Now we are not trying to argue, but if we cannot, in a short space of time think of at least 30,000,000 pounds more and 50 more products . . . and prove our thoughts, we will start the proverbial hat-eating! And . . . the survey was quoted in the Buffalo Courier-Express on November fifth which is close to some who could challenge.

WE are not going to quote anything more, but there is a comprehensive article in the October Technology Review that uses some of our data on the industry. We will do the Review the favor of handling calls for copies of the article, in spite of the fact that they speak of these products, in one instance, as "Plasters"!

SO you see we did quote again, though it was only one word.

THERE are many rumors around—even more than usual—concerning mergers, consolidations and such other combinations as are usually *de rigeur* in hard times. We aren't spiking these rumors at this time, but if the "hard time Buffer" will read the article by Clarence L. Collens in this issue he may still find cause for hope and comfort. Certainly to some it will be bitter medicine, but it is for any type of business man, be he molder, jobber, supplier or apple vendor.